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## Original Communications

### FURTHER STUDIES IN AUTOTRANSPLANTATION OF ENDO- METRIAL TISSUE IN THE RABBIT\*

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IN an investigation of the hypothesis brought forward by Sampson<sup>1</sup> in explanation of the origin and life history of ovarian hematomas of Müllerian type, experiments were devised in which it was attempted to reproduce in a laboratory animal some of the conditions which were thought to exist in women having this interesting clinical and pathological entity.<sup>2</sup> Adult rabbits were subjected to autotransplantation into the pelvic cavity, mesosalpingeal fat and ovary, of scrapings and very finely cut pieces of cornual endometrium. After 70 days it was found that this tissue had grown where placed and, what is more important, had also developed by implantation upon the peritoneum of the cornua, cervix and mesosalpinges. These ectopic growths were in the gross and histologically much like adenomata, particularly of the multi-locular cystic type such as are met with so frequently in the ovary in women. Even a simple incision through the wall of a pregnant segment was sufficient to liberate enough epithelial cells to produce implantation "adenomas." The evidence obtained from these procedures, so far as it went, was entirely in favor of the rationality of Sampson's ideas. If menstruation had occurred in an implant and following this rupture, further dissemination of epithelial "seed" would have resulted with the chances being good for further implantation. This would complete a striking likeness to the human disease.

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Fig. 1.—Drawing of the posterior aspect of the uterus and its appendages of a rabbit which 150 days previously had been subjected to autotransplantation of cornual mucosa. The animal was in heat when killed. At *a* and *b* are characteristic multicystic growths attached to and invading the fat of the broad ligament. The growth at *a* arose probably by direct transplantation, that at *b* by implantation.

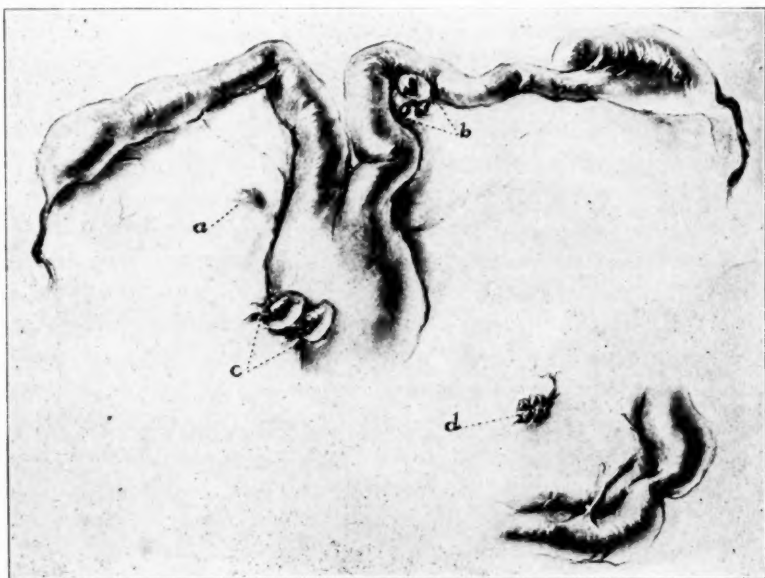


Fig. 2.—Drawing of the posterior aspect of the uterus and its appendages of a rabbit which had been treated as had the animal portrayed in Fig. 1. At *a* is a submerged cyst of endometrial type, at *b* and *c* are cysts resulting from endometrial implants. At *d* is a group of small cysts on the anterior surface of the mesosalpinx.

True menstruation is observed in the rabbit but the bleeding which follows the stage of congestion is very slight. This observation, how-



ever, was made on a very small number of animals and may not be entirely correct. At any rate when kept in solitary confinement the rabbit comes in heat at long and irregular intervals during the winter months. The first series of experiments was conducted over a period of 70 days, which proved to be too short a time for the animals to show oestrus or else what is more likely such periods had come and gone. In order to allow more time for oestrus to develop and to confirm the findings in the first series already reported, using the same method five nonpregnant female rabbits seven to nine months old, were subjected to autotransplantation of very minute pieces of endometrium into the mesosalpinges and free into the pelvic cavity. After 150 days these animals

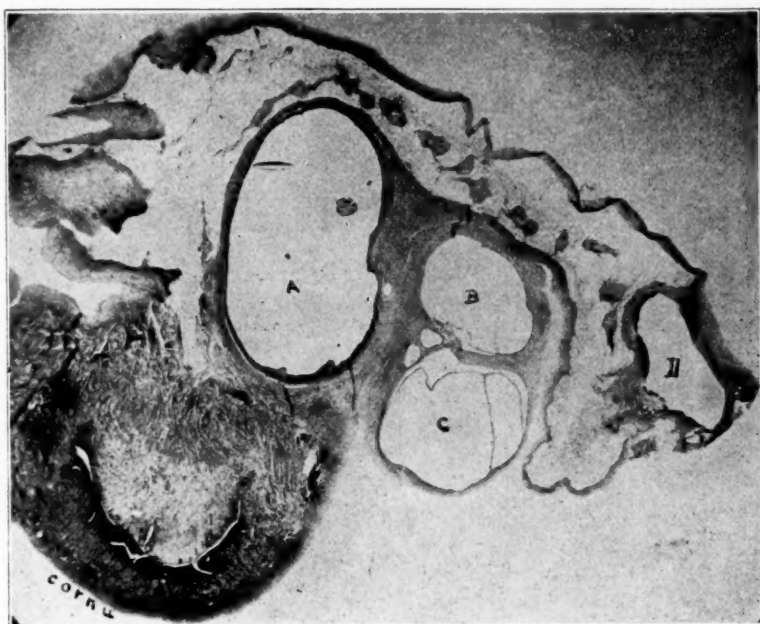


Fig. 3.—Photomicrograph, x20, of the left cornu of the rabbit in Fig. 1, through the cysts at *b*. Actual invasion of the cornu has not occurred. The contents of the large cysts A, B, C, and D, was a thin yellowish fluid, and slight recent hemorrhage had occurred along the inner surfaces.

were killed. In all of them cystic growths had occurred in various parts of the pelvis (See Figs. 1 and 2, for their gross appearance and location). The distribution of these implants was essentially that observed in the human in the case of a ruptured menstruating cyst of the ovary or of primary implantation arising from endometrial cells discharged through the Fallopian tubes. While the fat of the mesosalpinges was traumatized in several places, endometrial cells placed at these sites stayed "put" very seldom and many were found to have taken hold and invaded tissue several centimeters away, at points which may or may not have suffered peritoneal injury at the time of operation. The sites

of election for the growth of these wandering groups of cells were in the mesosalpinx and mesometrium. In a series of 15 animals the abdominal wall and mesentery were never involved. In one rabbit the omentum was adherent to a loop of small intestine which lay in the pelvis and in the adhesion an endometrial cyst was found. The pelvis then is the zone of location of normal endometrial cells set free in the abdominal cavity. This is true in all the animals used in these experiments as it is also in women with few exceptions.

The treatment of this syndrome of Sampson's is operative, but com-



Fig. 4.—Photomicrograph of a section through the group of cysts at *d* in Fig. 2. Around some of the cysts considerable smooth muscle has grown. Hyperemia and oestral hemorrhage has occurred in the stroma beneath the epithelial lining of several cysts.

plete oöphorectomy is done only when the implants are widespread or are giving severe local symptoms, such as intestinal obstruction from an "adenoma" of Müllerian type invading the pelvic colon. These ectopic "adenomata" are apparently under the influence of an ovarian secretion to the same extent as is mucosa of the uterus and Fallopian tubes. Castration results in great atrophy of the uterine and salpingeal mucosae, and implants from them undergo a similar regressive metamorphosis (Sampson). What their ultimate fate may be is not known

for the reason that the condition has been understood and recognized only a few years.

To study further this ovary-endometrium relation complete oöphorectomy was performed upon five nonpregnant rabbits about eight months old, and at the same operation transplantation into the abdominal cavity of endometrial tissue was done, after the method described above. In all of these animals growths were obtained and in the same locations as in the uncastrated animals. A marked difference, however, was in the size. In the castrated the cysts were about one-fourth as large and with much thinner walls. The lining epithelium was flattened and with little cytoplasm, the stroma very scant and fibrous. The fact that the presence of ovarian tissue is not necessary for a certain degree of de-

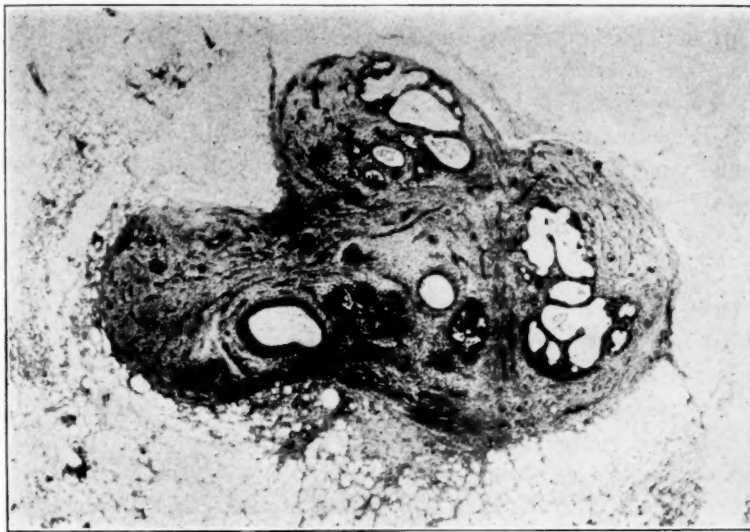


Fig. 5.—Photomicrograph of a section through the cystic growth at *a* in Fig. 1. Practically no smooth muscle is present, the reaction about the "adenoma" being more in the nature of very fibrous granulation tissue. Some blood is present in many of the cystic spaces.

velopment of this transplanted endometrium is of interest although really not surprising. The requisite ovarian hormone may have circulated in the blood for a period of time of longer or shorter duration following the extirpation of the ovaries and during this period implantation occurred.

That there is a certain danger in ectopia of tissue is well recognized by students of cancer research and in an animal harboring such growths as those just described, or in a woman who has had her ovaries removed for a ruptured menstruating cyst of the ovary with implantations, a higher cancer "potential" may with reason, be expected when the cancer age is reached.

In all of these experiments great care was exercised in order to trans-

plant mucosa alone. In some instances smooth muscle cells were included, and when mucosa and smooth muscle were transplanted together a structure suggesting another cornu was formed in miniature. Mucosa alone produced cysts, usually multilocular, and lined by ciliated columnar or cuboidal epithelium. Papillary ingrowths were frequent. The stroma was much like that of the endometrium except when the walls were so thin as to compress the stroma into a very thin layer or when there was much interstitial edema. Again is emphasized the gross and histological resemblance of many of the cystic structures produced in these rabbits, to the multilocular cystadenoma of the ovary in women—the great difference being, of course, that of size.

In two rabbits 150 days after the operative transplantation the cornua were swollen and congested. In several of the cysts found attached to and present in the mesosalpinx of these animals the blood vessels of the stroma were dilated and a small amount of fresh blood and some hemosiderin were found in the lumen along the wall. No cyst was filled with blood, however, and while this recent blood within the cysts was undoubtedly an oestral phenomenon, a real "hemorrhagic cyst" has still to be produced in the rabbit.

#### SUMMARY

Fifteen nonpregnant rabbits, seven to nine months old, were subjected to autotransplantation of scrapings and very minute pieces of endometrium within the abdominal cavity and the mesosalpinx. After 150 days it was found that (1) normal endometrial tissue free in the abdominal cavity attaches itself usually to the mesosalpinx or mesometrium, not to the abdominal wall or mesentery, and in only one animal was the omentum involved. This distribution is that of most cases of implantation resulting either from a primary dispersion through the Fallopian tube, or secondarily from a perforated hemorrhagic (menstruating) cyst of the ovary; (2) there are usually produced multilocular cysts which, except for their small size, are similar in many ways to the "ovarian" cyst adenoma of women; (3) extirpation of the ovaries at the time of transplantation does not prevent growth of the transplants, but the cysts formed are much smaller and thinner walled; (4) in two rabbits which were in heat at the termination of the experiment, the cornua were swollen and congested, and in a few of the cysts oestral hemorrhage had occurred in small amount but not sufficient to constitute a "hemorrhagic" cyst of the type so common in the ovaries of women.

#### REFERENCES

- (1) *Sampson, John A.*: Archives of Surgery, 1921, iii, 245-323. Amer. Jour. Obst., and Gynec., 1922, iv, 5.
- (2) *Jacobson, Victor C.*: Archives of Surgery, 1922, v, 281-300.

## ACID BASE EQUILIBRIUM IN PREGNANCY AND THE NEW-BORN

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PREGNANCIES, normal apparently, are constantly presenting new questions in study in chemistry and physiology. Metabolism, at this time is rather difficult to measure accurately because of the discomforts and stress of determination, hence comparatively little has been achieved in this particular branch, while in blood chemistry much has been accomplished. Studies in the nutrition of the fetus, and the manner of gaseous exchange through the placenta are constantly accumulating because of the relative ease with which the blood samples may be collected.

The question, as to whether there is any variation in the acid base equilibrium during the period of gestation, labor, and puerperium in the mother, and as to whether there is any relationship between maternal equilibrium and the newborn fetus particularly interested us and this paper is the result of the observation of a definite number of patients from the time of their entry to the clinic until their discharge.

Some time ago Ewing reviewed the question of acidosis. Then the term usually referred to an increased amount of acetone bodies in the urine and blood, together with an increased excretion of ammonia. Since then, the work of Haldane, Sellard, Henderson, Haggard, Van Slyke and others, has demonstrated that there is a deeper significance to the so-called ketosis, particularly, that the body is robbed of its bases. We now think of acidosis, or acidemia, as that condition where there is an acid retention sufficient to lower the bicarbonate or the hydrogen-ion concentration ( $P_H$ ) of the blood below the normal levels. Van Slyke's apparatus for measuring  $CO_2$  combining power has made it easy and practicable to measure the alkaline reserve of the body. The  $P_H$  of the blood may be considered as the indicator and when it is normal the acid base is normal or compensated, but if disturbed, the life of the individual may be endangered.

The average hydrogen-ion concentration of blood is at the slightly alkaline point, that is, where  $P_H$  equals 7.4. This figure was estimated by L. J. Henderson<sup>1</sup> and since then has been confirmed by numerous other investigators.<sup>2</sup> Researches in the  $P_H$  of body fluids other than the blood would apparently point to the fact that they all have a hydron concentration and bicarbonate concentration relative to that of blood



plasma.<sup>3</sup> The finely adjusted action of the blood and body fluids buffer is sufficient to keep the variations in any individual within marvelously narrow limits, so that by reason of changes of an almost instantaneous character, life is continued along a practically level plane.

#### METHODS

For this series, women who were as near normal as possible were selected. No cases with outstanding disturbances were included, for example, those with severe vomiting or those with any suspected toxic disturbance. All patients were on an ordinary diet with no reservations, fluids were urged up to at least 40 ounces daily and the usual exercise was advised. The blood for determination was taken approximately three hours after lunch. The arm was constricted with the tourniquet just enough to cause the vein to become prominent and the pressure was released while the blood was being collected. The blood was taken directly under oil into bottles containing lithium oxalate. They were maintained under oil during centrifuging and until placed in a separatory funnel to be saturated with alveolar air. The CO<sub>2</sub> percentage combining power was read after the manner and technic recommended by Van Slyke. In the case of infants, the blood was taken directly from the cord, the needle being inserted in a cord vessel as soon as sufficient cord was born to tap it, in some cases before the infant was actually born. Two samples were taken, one before the infant had breathed, the other, after the child had breathed well and cried vigorously. This blood, as previously stated was also taken under oil and kept under oil throughout the whole manipulation until the CO<sub>2</sub> reading was made. It is a well known fact<sup>4</sup> that the carbon dioxide capacity of venous blood plasma is consistently higher than arterial plasma by one-tenth. The fact that this has been shown makes the venous readings in pregnant women all the more striking in that they constantly tend toward acidosis figures. By carefully guarding the samples under oil error was eliminated as much possible, and the results recorded should be a fairly accurate indication of alkaline reserve since the readings were taken under conditions where the respiratory and circulatory systems were little disturbed and were reacting in a normal manner to normal stimuli.

The chart (Fig. 1) shows in a graphic way the fact of a definite drop in CO<sub>2</sub> plasma combining power and at the same time raises the question as to the cause. None of the patients at any time had any particular complaint and for the most part they were actually exercising less than previously, their activity decreasing definitely as they approached term. Urinary findings and blood pressure were undisturbed and in no case was the hemoglobin figure definitely raised or lowered.

None complained of respiratory difficulty and as far as we could detect there was no increase or deepening of respiration.

The chart (Fig. 2) is striking for the marked variation of combining power of plasma  $\text{CO}_2$  during labor. There is an evident drop according

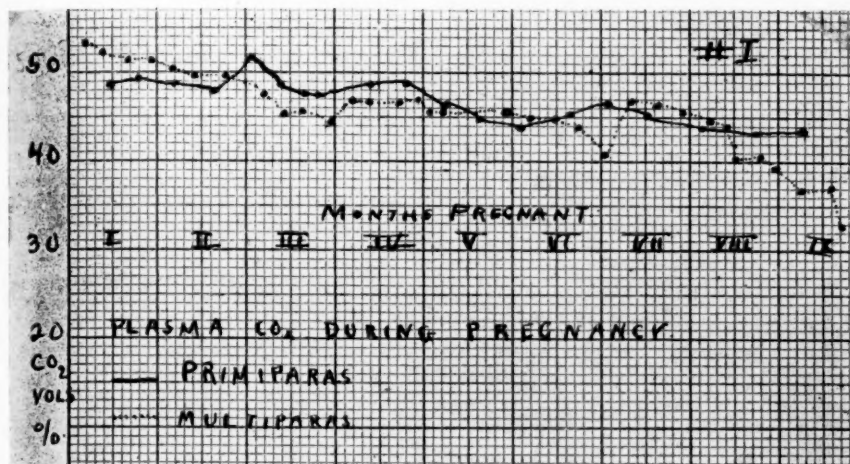


Fig. 1.—This chart shows a drop in  $\text{CO}_2$  plasma combining power in normal pregnant women.

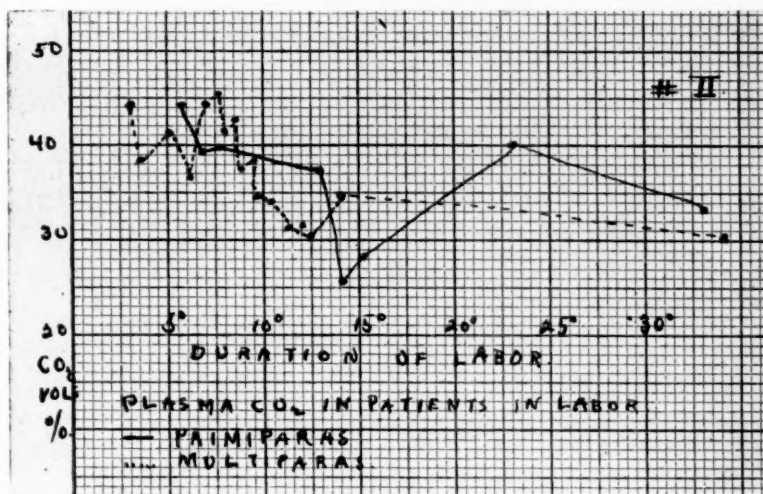


Fig. 2.—This chart shows variations of plasma  $\text{CO}_2$  during labor.

to the time of the duration of labor and although it has not been definitely pointed out in this curve, the cases having 35 vols.  $\text{CO}_2$  or less were distinctly those having the more severe pain, and also the pains were recurring at more frequent intervals over a longer period of time than in the case of those with the higher plasma combining power.

Practically all patients had an anesthetic, although for the most part it merely amounted to an analgesia, the patient rarely being completely unconscious except when the head was being born. Some of the patients had nitrous oxide oxygen and some others had ether only. The amount of anesthetic in all cases was small and the time of anesthesia short.

Fig. 3 carries the patients through from the standpoint of the average at each trimester of gestation and also at approximately ten days postpartum. The tenth day postpartum was selected because there was a variation and most patients would not return to the so-called normal figure before that day, although an occasional patient would. None of these patients had excessive hemorrhage and the hemoglobin readings were similar to those in any parturient woman, run-

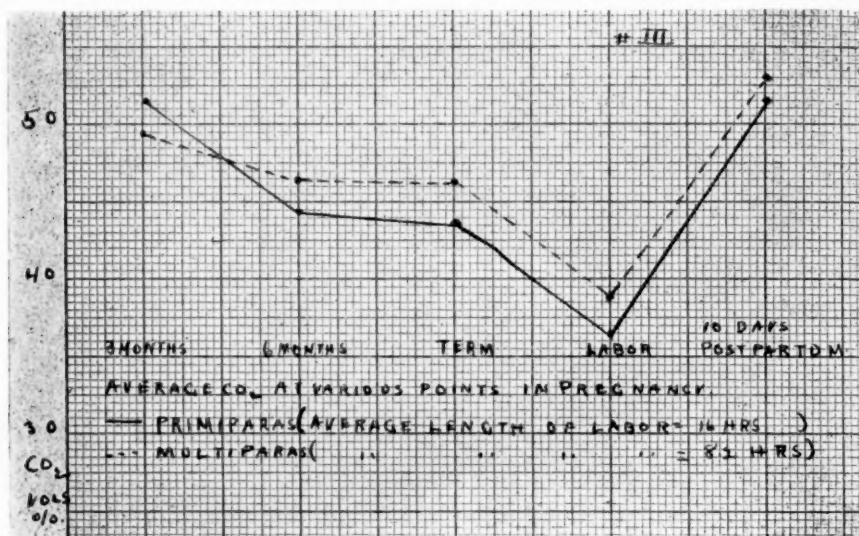


Fig. 3.—This chart shows changes occurring in pregnancy, labor and first few days postpartum.

ning from 60 to 75 per cent with an occasional patient slightly lower than the 60 per cent level.

The question of comparison of infant blood with maternal quite naturally arose and the results as above tabulated are instructive. I waited until the infants were breathing well and then withdrew the cord blood by puncture of a vessel, in each case using an umbilical vein. This vessel of course is the vessel supposedly carrying a purified blood, loaded with maternal nutriment, to the infant and it is more of an arterial nature than the umbilical artery, hence we would expect its contents, especially the gaseous ones, very nearly the same as the maternal. The fact apparently is that there is a marked and constant variation and the discrepancy is interesting as far as the CO<sub>2</sub> combin-

ing power is concerned, because it has been known for years<sup>5</sup> that oxygen and carbon dioxide pass readily from mother to the child. And yet here is a definite difference in the readings of two gases which are known to diffuse readily through a membrane by osmosis. In 1901<sup>6</sup> it was demonstrated by a comparison of freezing points that both maternal and fetal blood possess the same osmotic pressure, since their freezing points are the same, and therefore that osmosis should occur equally readily in either direction. The fact previously noted that the umbilical vein is richer in oxygen than the artery helps to make

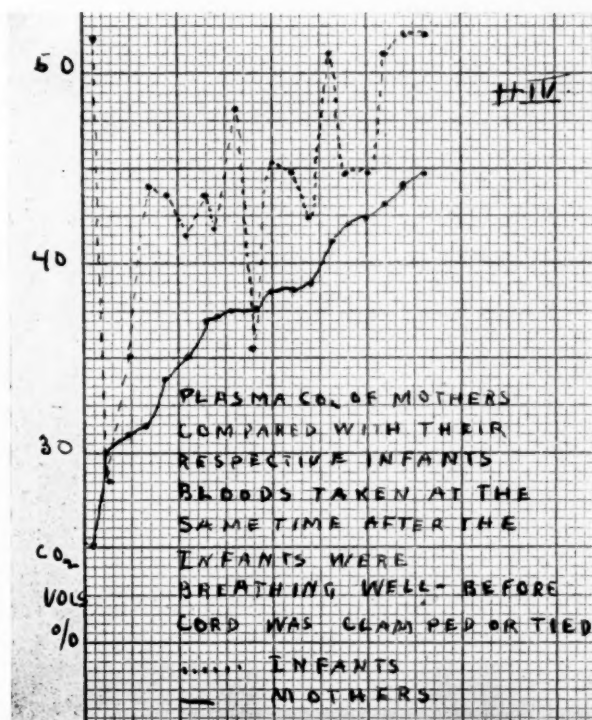


Fig. 4.—Chart showing curves of combining power of plasma CO<sub>2</sub> both of mother and infant.

the difference in the plasma combining power still more striking. The cases in the graph are charted opposite each other, each infant with its respective mother. Two of the infants showed a drop and were beneath their mothers' combining power and we have no explanation to offer. The conditions of delivery and removal of blood samples were as near similar to the others as it was possible to make it. I noticed too in the various samples, that the serum of the infants before breathing was consistently a bright red in color and after they had breathed and were well aerated the serum became the usual straw color. The

question as to whether it might or might not be due to hemolysis, caused by agitation in the oxalate, after the sample had been taken, or whether it was due to asphyxia, arose. The tubes were then gently rotated in identical fashion but the same phenomenon was noted. The spectroscope showed, in the samples previous to breathing, a marked amount of uncombined hemoglobin which was absent after respiration was well established. A few patients were carried under nitrous oxide to the point of being quite cyanotic and blood taken at this time showed a similar reaction in the maternal blood so the color difference is due probably to partial asphyxia. I also noted that if the blood was allowed

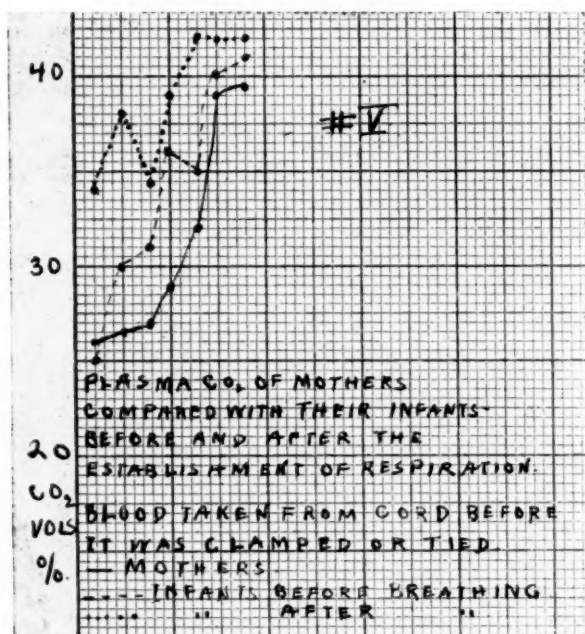


Fig. 5.—Comparison of mother's and infant's blood before and after the establishment of respiration.

to stand, the corpuscles in the infant sample came down and separated from the plasma much more readily than did the maternal corpuscles in the same case.

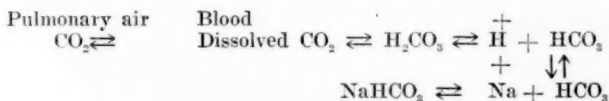
Having noted a discrepancy at the outset between the fetal and maternal blood streams, the suggestion might be made that the difference was due to the fact that the child was not yet breathing well and was partially asphyxiated during the time of delivery. Chart 5 demonstrates that there is a constant difference between the two bloods both before respiration is established and after the child is breathing and crying vigorously.



## DISCUSSION

The graphs presented are of interest because they show a definite and characteristic drop in the plasma combining power as gestation goes on to completion and labor, in several cases the figures fall within the dangerous or fatal limits. The normal carbon dioxide combining power varies according to investigators<sup>7</sup> between the limits of 50 and 63 volumes per cent and it is an accepted fact that the venous combining power is about 7 per cent higher than the arterial. Cannon,<sup>8</sup> in writing of acidosis in shock cases, remarks that any figure below 50 per cent in an adult indicates an acidosis. The critical level<sup>9</sup> experimentally has been placed between 33 and 36 volumes per cent and it has been demonstrated that when there was a fall below the lower figure death usually resulted speedily. In view of such statements, the patients, whose combining power fell within and below the so-called fatal zone and yet recovered, demonstrate again the fine body adjustment mechanism toward protecting the individual when within the danger limits. These findings suggest a cause for the sudden deaths which occur in cesareans or other types of delivery, when before the mishap and yet when the anesthetic has been administered, death occurs suddenly. There will be no relaxation of the uterus or profuse hemorrhage, but the pulse suddenly softens, disappears, the blood pressure falls and the patient apparently dies of shock death type. It would not be amiss to ascertain the carbon dioxide combining power of plasma in all operative cases previous to operation and to guard therapeutically against disaster according to the indications given by the carbon dioxide reading.

The drop in plasma combining power indicates a decrease in bicarbonate reserve. The whole mechanism is graphically expressed in the equation of Henderson,<sup>10</sup> the so-called physico-chemical equilibrium.



A change in any of the factors concerned will immediately shift the reaction either way.  $\text{H}_2\text{CO}_3$  is the most easily disturbed and varied factor activating, and at the same time being regulated by the respiratory center. Body mechanism for diverting bicarbonate to or from the blood stream is largely accomplished by respiration and the maintaining of blood  $\text{P}_\text{H}$  level is aided by the blood buffers. Among these buffers none plays a more important rôle than hemoglobin by virtue of the reversible reaction  $\text{H}_2\text{CO}_3 + \text{NaCl} = \text{HCl} + \text{NaHCO}_3$ , the red cells control the basic carbonate and transport the larger part of the  $\text{CO}_2$  to the lungs. In addition, the  $\text{HCl}$  probably passes into the cell

and is held there by hemoglobin and then when the equation would shift the reaction  $\text{HCl} + \text{Na}_2\text{HPO}_4 \rightleftharpoons \text{NaCl} + \text{NaH}_2\text{PO}_4$  comes into play and the acid phosphate is excreted into the urine. Previously it has been remarked that the hemoglobin showed no special variation in these patients hence the question is still unanswered as to the cause of the drop of the  $\text{CO}_2$  combining power of plasma.

The factors decreasing the body bicarbonate for the most part are the increased production or decreased elimination of acid substances; elimination by the urine; lack of oxygen; impaired or slowed respiration and hyperpnea.

The difficulties connected with accurate metabolism studies of pregnancies prevent a definite conclusion as to whether actually there is a marked increase of the metabolic processes which might in turn be employed to interpret the acidosis appearing in the charts. Laboratory workers<sup>10</sup> have found that the energy metabolism in pregnant women expressed per kilogram and hour is but little larger (4%) than for women in complete sexual rest.

It is acknowledged that increased pulmonary ventilation will shift the balance of mass action toward acidosis. Magnus-Levy working with pregnant women before and during gestation<sup>11</sup> found a definite rise in oxygen consumption after the fifth month and attributed it to increased ventilation, increased cardiac work and some increase in absolute metabolism and development of the fetus. This might account for the changes taking place up until the time of labor, but at that particular time there are other factors entering into the matter. In labor, until the beginning of the second stage, there is definite work carried on by the uterine muscle and after the beginning of the expulsive stage the whole organism is working at top speed. It is a well known physiological fact that muscular activity will increase the excretion of carbon dioxide. Quite recently experimental work has demonstrated that with muscular exercise there is a definite drop of 5 to 10 volumes per cent of  $\text{CO}_2$ .<sup>12</sup> The cause of the drop is supposed to be due to the accumulation and removal of lactic acid in the tissues. The blood bicarbonate is diminished when the  $\text{CO}_2$  tension is increased and respiration is then inadequate to remove all the  $\text{CO}_2$  produced in exercise. A continued diminution in arterial alkalinity would be due to an accumulation of lactic acid with a consequent decrease in the bicarbonate content. This brings up the question as to whether there would be a disturbance of blood phosphates sufficient to be detected by the ordinary means. Samples of blood were taken on the patients with the lowest combining power figures, during the time they were in labor and then postpartum when the carbon dioxide combining power had practically returned to its normal level and the figures as presented show no remarkable difference.

Phosphates of blood at conclusion of labor.	Phosphates of blood ten days postpartum.
3.3 mgs. per 100 C.C. of blood	3.7 mgs.
3.9 " " " " "	4.1 "
4.0 " " " " "	3.8 "

These figures prove merely that the blood stream mechanism for maintaining a balance is certain enough to guard the welfare of the patient and to keep the  $P_H$  within very definite and narrowly prescribed limits.

It seemed that in the patients with marked drop toward the acidosis side there would be change enough in the blood  $P_H$  to detect a change even though that change might be slight and transitory. Five patients were taken and the results are:

Vols. $CO_2$ per cent:	$P_H$ reading:
50.5 %	7.3
41.4 %	7.3
44.3 %	7.5
36 %	7.4
39 %	7.3

These readings are proof positive that either there is no change or else the adjustment is so rapid that we are unable to get the readings when there is a decided swing either to the alkaline or acid side.

It would seem fair to assert that there was a definite increase of the pulmonary ventilation, for most women in labor, although it has never been definitely demonstrated, breathe more rapidly and usually more deeply. This is especially true when analgesia is employed, for then the patient is instructed to breathe deeply and is coached to inspire to her utmost capacity to escape sensation of pain.

A second factor entering into the problem is that of pain. The work of numerous men, especially since the war, has shown how closely trauma and pain is followed by shock, which in turn would give a definite decrease in carbon dioxide combining power. Cannon<sup>13</sup> has shown in the war wounded, that the lower the blood pressure the lower will be the alkaline reserve, but he also mentions that he detected no definite voluntary hyperpnea until the combining power of plasma fell to 30 volumes or less. The entity of postoperative shock is too well known to require discussion and assuredly everyone who has been forced to do a difficult forceps or for some special reason has been compelled to finish the dilatation of a cervix, appreciates the results as shown by the patient. Rarely indeed is true obstetrical shock encountered when the patient goes through an apparently normal labor. Occasionally there will be a case where the onset of shock is sudden

with all the signs of profound depression with no evident cause for the collapse and in such a case recovery is spontaneous with a little symptomatic treatment or merely with rest.<sup>14</sup> Pain<sup>15</sup> does cause excessive breathing and an abnormal, extensive pulmonary ventilation which in turn causes the dropping of the carbon dioxide content of the blood. As far as operations are concerned in this factor, observations differ. One observer<sup>16</sup> in researches found that with operations and anesthetics lasting, on an average, 52 minutes, the fall in carbon dioxide combining power of plasma was 12 volumes. Others<sup>17</sup> say that most operations and anesthetics do not lower the combining power to the point where an acidosis is noted.

Ether and nitrous oxide with oxygen were the anesthetics employed and it is beyond question that anesthesia lowers the carbon dioxide combining power of plasma. The mechanism of the anesthetic reaction is based or explained<sup>18</sup> on the ground that the disturbance is wholly due to disturbance of the respiration. Ether hyperpnea will drop the level to within the dangerous and fatal limits of 31 to 33 volumes per cent while, on the other hand, if the ether anesthesia is deep enough to cause a depression of respiration there will be a rise in the carbon dioxide combining capacity. A light irregular ether anesthesia is most dangerous to patients because it is most effective in reducing the carbon dioxide of the blood. This lowering is due to the excessive blowing off of carbon dioxide by the lungs and hence the tissue bicarbonate is not called out to combat the increasing acidotic blood and acid products. Unoxidized end products<sup>19</sup> as aceto acetic acid and B oxybutyric acid are heaped up as a result of cell metabolism disturbed by the anesthetic, and death occurs suddenly with a fall of blood pressure, a failure of circulation and almost immediate cessation of respiratory function. It is of note in this connection that the CO<sub>2</sub> combining power of spinal fluid tends to remain at a higher level than that of blood plasma in cases of shock, an apparent protective mechanism so that the brain and spinal cord tissues are afforded an extra protection from either an acidosis or an alkalosis of the blood stream. Recently it has been proven also that not only is there an initial acidosis after the inhalation of anesthetics such as ether, chloroform and nitrous oxide with oxygen, but also after the inhalation of formaldehyde, pure nitrogen and pure oxygen.<sup>20</sup> The anesthesia would surely seem to bear a part in these patients because in each instance the anesthesia was of short duration, usually light and irregular since one had to be content with persons handling the anesthesia whose skill would vary.

The urine reports merely conform to the work that has already been done repeatedly, acetone and diacetic acid were found in practically every case where labor had lasted two hours or more. A slight trace

of albumen was usually noted directly after labor, probably due to muscular action just as the acetone is due to muscular action with an excessive breaking up of carbohydrates caused by effort. It has been previously remarked that there was no change in blood phosphates. It would be an interesting question to determine the  $P_H$  of the urine during and directly after labor, especially in view of recent work<sup>21</sup> where the inference is drawn that the elimination of carbonic acid is directly proportional to the carbon dioxide tension of the blood. Some years ago<sup>22</sup> a writer remarked that a diet producing an acid urine would cause a low carbon dioxide tension of the blood and this may bear a part for all patients who had a definite acid urine during the last trimester of pregnancy. Experimentally when acid phosphate is given,<sup>23</sup> there is a distinct decrease in renal urea excreting activity and a shift in the plasma toward the acid side with a decreased plasma  $CO_2$  combining power. The body base too is saved in the elimination of phosphoric acid by reason of the fact that the  $P_H$  of the urine is much greater than that of blood plasma.<sup>24</sup>

The difference between maternal and fetal blood is curious since we believe that osmosis is operating and that there is a free exchange of gases. The incidence of birth factors, pertaining to the infant and having a bearing on this question, would be dystocia with excessive head moulding, cerebral contusion, laceration or rupture of vessels, internal edema and cerebral congestion, pronounced fetal asphyxia such as compression on the cord with a resulting decreased respiratory stimulus, asphyxial lesions such as chest injuries, atelectasis, congested viscera (especially the adrenals), severe and rapidly recurring pains with the shutting off of fetal blood supply, and the beginning separation of the placenta as soon as the infant is born. No nerves as yet have been demonstrated in the placenta,<sup>25</sup> but it has been shown that the placental vessels have their action regulated directly, dilating from lack of oxygen and contracting when there is sufficient supply. While the fetus is *in utero* it is in a state of apnea. Its activities are limited and the gaseous exchange sufficient for its needs is carried out through an unimpaired placental circulation. During the actual time of labor and from the time the child is born until breathing well, there is doubtless a balance between the blood oxygen and carbon dioxide to keep it viable. Probably during uterine life the stimulus necessary to excite the respiratory center is much greater than after birth and the irritability of the respiratory center declines as the fetus approaches maturity. Feldman<sup>26</sup> accepts the theory that the center becomes increasingly more irritable due to the fact that the blood reaching the fetal medulla has an increased vascosity due to the gradual narrowing of the ductus arteriosus. Partial asphyxia thus is approached and with the onset of labor and the interference of circulation in the



placenta by reason of pains, a state of asphyxia is established and thus the fetus passes from apnea to dyspnea. Any undue interference with the circulation over any period of time by reason of denying blood to the fetal medulla will paralyze the respiratory center so that it is with difficulty that the fetus is resuscitated if at all. It has been shown<sup>27</sup> that a gradual arrest of circulation will soon exhaust the respiratory center. All infants are born in more or less asphyxiated condition and we have both the external stimulus and the blood stimulus from accumulation of carbon dioxide working together to compel the child to breathe. Previous to birth his respiratory center has been less irritable and has been regulated by the maternal blood stream through the placenta, but at the moment of separation perforce he is thrown upon his own resources and upon an apparatus which is comparatively unused and strange to the task suddenly thrust upon it. These suggestions may account for the difference in the carbon dioxide combining power between infant and mother. It would be satisfying to take the blood from the infant sinus at the end of 12 and 24 hours when the respiration was well established and then to ascertain whether the figures were near normal or not. There is a definite lag apparently in the interchange, however, between mother and infant, although this may be partially accounted for by the beginning separation of placenta, for even though the cord is still pulsating the uterus may be shut down and interfering with the sinus exchange between mother and placenta. The low carbon dioxide combining power is interesting also in view of the fact that one of the blood buffers, hemoglobin, is abnormally high in the first few days of life and there might be a change in figures coincident with the drop in hemoglobin.

#### CONCLUSION.

1. There is a definite decline in the venous plasma carbon dioxide combining power of women during pregnancy and labor with a return to the normal level ten days postpartum.
2. The figures may drop to within the dangerous or even fatal limits, and still the patients recover, apparently always staying within the limits of compensated acidosis.
3. Excessive pulmonary ventilation due to increased metabolism, weight, pain, muscular exercise in labor and anesthesia, all have a part in producing the change in readings.
4. A certain proportion of sudden shock type deaths occurring in pregnant women in labor are probably of an acidotic nature and might be guarded against by regarding this factor of lowered carbo-dioxide tension.
5. There is a definite and constant difference between the plasma combining power of the mother and the infant.

6. The difference noted between mother and infant may be due to physiological lag at the placental barrier, partial asphyxia or an inadequate infantile apparatus for preserving equilibrium.

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805 HIGHLAND BUILDING.

## THE BROADER ASPECTS OF THE BIRTH CONTROL PROPAGANDA AS IT SHOULD INTEREST THE PHYSICIAN\*

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ON an evening devoted to a consideration of the sociological aspects of our specialty, it seems appropriate that attention should be accorded to the propaganda popularly designated as "birth control." As physicians we are expected to lend aid and encouragement to all propaganda for the betterment of social conditions. But whether we ought not to regard the present-day movement about to be discussed, as "agitation" rather than "propaganda" may well demand further inquiry. There are so many points of view to this subject that the brief time allotted hardly suffices to present anything more than a very superficial review of the situation. Perhaps it would be better therefore to separate the more technical aspects from those of a general character and to speak of the propaganda or agitation as it affects, or as it should be of interest to the medical profession. Unfortunately the laity, and a certain number of physicians, regard the objections which have been made in medical circles to any public and indiscriminate dissemination of contraceptive information, as based on selfish motives and do not give credit to the objectors for a possibly deeper insight into the various phases of the question, which is based less on sentiment and more on reason.

Let us consider for a moment what are the possible motives behind an agitation which has absorbed so much public attention and has now developed into an endeavor to change the Federal and State laws that are claimed to limit the proper spread of birth control knowledge. A mass of literature has been published by various organizations that have taken upon themselves the solution of the problem for relief from what they consider an interference with personal liberty, by appeals couched in the broadest language and directed towards public sympathy rather than public sense.

The arguments advanced by these reformers, professional and otherwise, organized into various leagues and societies for the protection of motherhood or voluntary parenthood and with other high sounding titles, have vacillated between fears of possible human overpopulation and the declaration that a woman shall have the right to say how many children she shall bear, and at what time. It is very essential to separate real and true arguments from those that may be nominated as

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fancied. Students of the subject have claimed that overpopulation will sooner or later bring about all sorts of evils in its train. They do not seem to take into account, however, that it is not only overpopulation alone which determines some of the factors from which they seek relief by a restriction in the size of families. They are very fond of quoting the Chinese and similar horrible examples of what takes place when overpopulation occurs, but they do not seem to realize that there would be no overpopulation in China if its many peoples could be spread out over that vast country. It is the crowding and herding of the Chinese population along the waterways and the inability to feed them because of the sterile character of so much of the country, due to man's own devices, that the unfortunate condition of a large portion of the Chinese population has been brought about. The Malthusians have developed, to them, an impregnable form of reasoning by which they attempt to show that food, among other things, will become insufficient unless checks are placed on the present so-called overgrowth of the people of the earth. But despite the prediction of Malthus and his followers, the food supply per capita is greater and more varied now than in his day, or for many years after. Such reasoning is defective in many respects and we must not lose sight of the fact that a normal increase in population is largely dependent on natural causes and that the size of any individual family cannot be taken as a criterion in assuming that all marriages are necessarily accompanied by a brood of children. The individualistic conception of marriage and children is always brought into the foreground and the heartrending description of a mother subjected to frequent childbearing that is beyond her strength and means, is a favorite picture to solicit sympathy and contributions for the many organizations that have taken upon themselves the task of adjusting our social conditions in this respect.

One would think that the millennium could be reached if only parenthood could be made voluntary rather than accidental. It is claimed that the first step toward that end demands the removal of the words "preventing conception" from the Federal obscenity laws "which now besmirch and degrade the question of intelligent parenthood by including it with penalized indecencies." Moreover one of the leading organizations has for its object "the education of parents so that the birth of children may occur with due regard to health, heredity, income, choice, environment and the well being of the community." And how is all this to be brought about? Merely, it would appear, by the public dissemination of so-called birth control information. All restrictive laws whether they are embodied in our postal code or in our various State codes should be wiped out. Under the guise of permitting medical men to be allowed to give such information to their

patients, it is hoped that this privilege may likewise be granted to trained nurses and other volunteer workers. Just as soon as a mother, or a prospective mother, is acquainted with this knowledge all care and worry connected with the marriage state would cease. Children would come when, as, and if desired, and otherwise the natural attraction of the sexes toward each other could be indulged in without fear of consequences. But is this happy state in accord with what we meet with in our daily observation of cases, or nations for that matter, where birth control, so-called, is widely practiced?

France is often referred to as the land where birth control methods have reached the highest point of development and France's record during the war is pointed to as a most recent evidence of what a country thus controlled can accomplish. This is hardly in accord however with the efforts which France herself is making to overcome the reduction in her birth rate. Nor is it in accord with the large families of the French rural and small city population.

In this country the birth rate in our native born population has materially decreased with recent decades and the so-called intellectual classes are credited with about one child plus. No deep thinking is needed to show that a one or two child family as a standard will soon cause a halt or even step backward in our national growth. Intellectuality as a trait is known to be liable to atavistic tendencies, or less politely speaking, to revert to type. We therefore require for replacement purposes, and must depend on the urge from below as it were, from families where the numbers in their progeny result in a struggle that naturally selects the fittest and places them in a position to supplement the intellectual generation that preceded them and perhaps failed. This may be regarded as exaggerated, yet it is but the working out of natural and economic laws, and as physicians our teaching should lead us to see how hopeless and futile it is for man to control such matters beyond a very limited extent.

After several years abstention from this subject I found it necessary by way of preparation for this paper to take up again the voluminous scattered literature on the subject of birth control. Notwithstanding a claim to some familiarity with the subject, I must confess a lack of understanding or appreciation of most of it. One gains a rather mixed impression from such reading. On the one side of the discussion the more numerous and vociferous, a gathering of sociologists, society leaders, uplifters, reformers, and radical thinkers of every type, with a few doctors,—on the other, in opposition, the clergy, mostly Catholic, and a few more doctors. One is surprised there are not more members of the medical profession to give either their sanction or their objecting voice. Let us consider briefly the two opposing camps and their arguments.



It has seemed to me that there are two general classes of "birth control propagandists." In the first group we find a considerable number of literary persons, sociologists, eugenists, publicists, and a few physicians, who earnestly and sincerely believe that the evolution of the human race in other phases demands equal attention to one of its most important functions, namely, the reproductive processes and that the element of chance and accident should be eliminated in the development of the family. It is claimed that biologic growth in the animal kingdom has changed the wasteful production in the lower forms, as the million progeny of the fishes, to the simple embryo of the higher mammals, brought into the world quite fully developed, yet requiring the further sustaining and protective powers of its maternal and paternal progenitors. This group claims that rational and scientific birth control is not the fixing upon the race of a new and unfamiliar practice or policy, but is rather the scientific correction of a practice now followed by the majority of married persons in civilized countries, though in a bungling, unscientific and frequently a harmful manner (Armstrong). They seek to replace these by scientific, harmless, approved methods and under sanction of the law rather than contrary to it. In this view they find nothing immoral, nothing selfish, and although admitting that all this would lead to a lower birth rate claim it would also lead to a lower death rate. As Havelock Ellis has said, "The fewer the children born, the fewer the risks of death, disease and misery to the children that are born." The members of this group believe that quality rather than quantity is the racial ideal, and that the science of eugenics or racial hygiene should be accorded greater attention, so that racial selection instead of being carried out by the "destructive, wasteful and expensive method of elimination, through death," shall in the future be "carried out more effectively by conscious and deliberate selection." One writer (Glaton) who admits the futility of legislation to elevate the race, believes that the hope of the future is in eugenics becoming a part of religion, that the good of the race lies not in the production of a superman, but in a superhumanity. This group of writers and thinkers says little or nothing about birth control from the narrower medical standpoint, as in the presence of constitutional disease or infirmities. They seem to be interested rather in the question of family limitation.

A second, more radical, group is made up largely of well meaning but usually misguided lay persons, carried away by sentiment and aided and abetted by a peculiarly constituted class of individuals, always ready to take up anything new in the way of reform so-called, for their personal aggrandizement and often for their personal gain. A harrowing picture is drawn in their circulars of

the evils of "reckless" childbearing, that children should only come when desired, that mothers will necessarily become slaves and drudges unless shown how to avoid conception, that child labor, prostitution, abortion, the deaths of countless mothers and babies will all be prevented and that the home will be a "place of peace, harmony, and love," if only those annoying Federal and State restrictions could be abolished which now stand in the way of the aforesaid well meaning persons and their organizations, broadcasting scientific, safe, and harmless means for avoiding conception to suffering mothers and anxious fathers. Nothing more is needed to bring on the millennium if only trained nurses and social workers could without legal restraint disseminate such knowledge freely to a receptive humanity. Their literature is very convincing and many of their tracts throw into the deepest shadow some of the blatant advertisements of medical quacks and others who have come under the ban of the propaganda department of the American Medical Association. Moreover a perusal of the lists of names backing these ventures will be found to contain those of many well-known radicals in other lines of thought, as well as professional reformers ready to seize upon any propaganda which will secure them a "job" as managers or directors. It pays to advertise. And with it comes the cry for funds, funds and more funds, all to be expended, at least so their circulars state, for influencing legislators to change certain portions of our federal and postal laws and state penal codes.

To the physician, who is in a position to be acquainted with the facts, the assurances of infallibility claimed by the propagandists for their contraceptive measures, verges on the ridiculous. We all know how uncertain most contraceptives are and that assurances cannot be given to any patient that the devices or methods are free from danger to themselves or are absolutely certain of prevention of conception. We hear much about scientific, harmless and efficacious methods and devices which are supposed to be the private property and knowledge of the medical profession. It would be interesting to canvass physicians to find out what these measures are. My own confession of a lack of personal knowledge will undoubtedly be echoed by other members of the Society. It is true that we can make certain recommendations and that we can suggest the use of contrivances that may prevent conception but more than this we cannot do, and any guarantee is an assumption not borne out by facts and experience. But the laity to whom the appeals are made is misled into believing that this knowledge is kept from it for selfish and personal reasons. Such an attitude of course is ridiculous but it serves the purpose of those who desire to attain their ends even at the expense of deception.

The foregoing is but a brief reference to the affirmative side of the

argument. One rather questions the sincerity of much of it—those who are giving the funds are probably sincere and well meaning—can as much be said for those who are spending them and to whom “reform” spells the breath of life?

Let us refer, also briefly, to the other side of the argument. The very appealing circulars and other documents published by the various associations who have endeavored to correct our legislative failings are somewhat difficult to answer because little has been published in opposition either by lay or medical writers, and the only consistent activity is that manifested by the Roman Catholic church. It is quite needless to go into the latter's attitude more freely except to call attention to the fact that while the Catholic church positively and vigorously condemns and prohibits the use of contraceptive measures, its representatives are careful to state that they do not question the lawfulness of birth restriction through abstinence from the relations which result in conception. Of course this attitude can only affect the members of this particular church and thus far no other religious organization has officially made public any decision on the subject. But we must not forget that religious ideals have changed since their formulation in the early days of Christendom and divine commands so plentifully employed in the first centuries after the establishment of the Christian religion, no longer govern our social standards. Ideals of human betterment result rather from an appeal to reason and judgment and involve restraints of impulse which are dependent on knowledge received from experience. The direction to “increase and multiply” must be regarded merely as a tradition in this day when the population of the earth has reached limits that must have been unfamiliar to the early prophets. True religion has become more vitally concerned with the relation of man to man and the welfare of society in general.

Taking up the medical side of the argument, we may assume that there can be no question or difference of opinion regarding the necessity for contraceptive measures in certain cases. The tuberculous, the cardiac, the nephritic are only among the more common general illnesses that demand abstention from childbearing, and there are local or obstetrical situations that must likewise be considered. But this is a small group as compared with that in which a personal or an economic factor is the leading one and for whom our birth control organizations are also endeavoring to find relief. Just how far we ought as physicians to go in prohibiting sexual intercourse among our patients for nonmedical reasons, is a question to be most carefully considered. No one has yet conclusively demonstrated that sexual abstinence, partial or complete, is fatal or even dangerous to health. We forbid tea, or coffee, or tobacco, or red meats, exertion and excitement, and

many other things—it is no more illogical to forbid intercourse in certain constitutional diseases in husband or wife, or to limit it in others. It seems to me that we have little right to go beyond these limits. The sex “urge” is claimed to be too strong for mere human control, but yet how often do we see it curbed in athletes in training, without ill effects.

Artificial restrictions in normal sexual intercourse particularly in the early months of married life may produce serious consequences in a woman's pelvic organs and either lead to subsequent sterility or actually hide the presence of the latter condition for a period during which something might have been done to relieve the same had its existence been known.

The fear of pregnancy especially among the unmarried, has been widely ridiculed as an objection to the dissemination of contraceptive knowledge, insofar as it may be regarded as a protective factor in maintaining morality and virtue. Nevertheless it is and will continue to be a very practical factor. However, if we as medical men regard birth control from the standpoint of morality or immorality we are venturing on a domain that we are scarcely qualified to discuss from any but the narrowest viewpoint. As physicians we must theoretically condemn illicit sexual relations because we know of the possible pathological consequences, but beyond this we cannot go—fornication has not yet been labelled a crime. However, our training and our study of the human mind and its frailties make us fully cognizant of the dangers that would result from any lack of restrictions to contraceptive knowledge such as that advocated by the birth control propagandists insofar as this moral status is concerned.

The physician, however, is drawn into the discussion by a direct appeal to his opinion whether contraceptive methods are injurious to health and this is a difficult question to answer offhand. There are no doubt many practices and methods which affect the health of the participants, but whether the so-called harmless procedures manifest any such influence no one can definitely state. It is entirely a question of individual trial and application and demands study based on statistics and observations which are not yet on hand.

There are many who interpret a system of birth control as leading to race suicide, and that it is the duty of the physician because of his interest in such questions to counteract the prevalence of this idea. I believe that the proponents of birth control rather exaggerate this matter and that other factors are at work which they do not recognize. This leads one into speculative fields that would take more time to discuss than we are permitted.

It has been estimated that in order for a nation to maintain itself without increase or decrease, the average family must consist of at least



four children. This in order to compensate for a death rate of about 10 per cent during the first year of life. The national census (1900) shows that out of 100,000 individuals born, only about 78,000 are alive at the average age for marriage. But not all of these people marry, from 12 to 15 per cent do not, and about 7 per cent of all marriages are sterile. The truth of these facts must be evident to all of us, and if we place further restrictions, by official sanction, on the natural reproductive processes, the displacement of the better groups by those less economically and socially sound, will be even more rapid and standards will be correspondingly levelled. We need rather a system of birth release than a system of birth control.

I have endeavored to present the pros and cons of this important subject in as few words as possible although in doing so I must acknowledge my failure in not adequately taking up all phases of this broad subject. As physicians and particularly as obstetricians it devolves upon us and perhaps the public may expect from us, some formal expression of opinion as to our attitude for or against the general proposition of birth control. I believe that most of us feel that exaggeration, deliberate or accidental, has characterized much of the agitation now so widespread. As a group of specialists perhaps more directly concerned than any other, should we do anything to alleviate this exaggeration? It seems to me that we have this duty and should not shirk it. Whether our advice will have any weight is, however, problematical. As the greater part of the agitation on the subject seems to deal with a desire to do away with legislative restrictions to the dissemination of birth control information, we should perhaps first express ourselves on this point. The Federal Penal Code, section 211, does not really label birth control information as obscene matter although we are being led to think so, but from what is known of the general character of contraceptives distributed through the mails, most of such devices cannot be designated in any other manner. The Penal Code of the State of New York, sections 1141 and 1142, practically duplicates the Federal law, providing for a fine and imprisonment for any offence against the same. At the same time our State statute provides for the physician's participation in legitimate contraceptive measures and the Court of Appeals of this State has likewise decreed that no physician could, or would be, molested in the legitimate practice of his profession as it involves the dissemination of birth control information. But this evidently is not satisfactory to those who desire unlimited and indiscriminate dissemination of knowledge that they claim is being unjustly kept from the people at large.

Expediency must guide many of our actions and experience has shown that the inclusion of the laws referred to have done more to



keep this country free from undesirable literature, indecent pictures, and other things, than any other factor except perhaps the generally prevalent high moral standards of this great nation. It seems to me therefore inexpedient to release for public information without discriminatory precautions, information that would in the end be most detrimental to many of our people. Yet we must recognize that this exaggerated state may be based on a true desire which is in accord with so many developments of the present day that would have been frowned upon half a century ago. Among these none looms up larger than the greater freedom accorded to women—the right that they shall have an equal voice in government, in the making of laws that apply particularly to their sex and in the decision finally to have children when they see fit. This change in the psychology of women must be taken into account—we cannot as men pass it over with the assumption of a superior sex. Yet I think we can lead the thought into the right direction and it is to this purpose that we must lend our energies.

It seems to me that it would be much more desirable and valuable for us as physicians to regard the larger question of birth control, or the smaller one of contraceptive measures from the standpoint of fertility of the race. Smaller families and fewer and better children appeal to one as of greater value to the community than reckless childbearing, but the question remains that we may inculcate notions into the minds of people who are not in a position to observe, to understand, or to practice them. It will require more than the mere doing away with restrictive legislation or the founding of so-called birth control clinics presided over by well meaning women to solve this problem. It must rather be done by a process of education applied both to the individual and to the mass—education which begins with the training of our school children in the meaning of sex and reproduction, just as we train them in the ordinary rules of hygiene governing their digestion. At the same time it may be possible for us to formulate not laws, but opinions, not contraceptive clinics, but attempts to control policies and methods. The close personal relation between physician and patient should never be set aside and the profession should not ally itself with any state or municipal controlled or even private lay institutions organized for this purpose. It would be better if the profession could bring about such a change that every hospital and dispensary organized for the treatment of gynecologic or obstetric patients, would be in a position to take up with its individual applicants the desirability of restricting pregnancy in the presence of definite pathologic indications rather than those of an economic nature. This feature of course only includes that class of our population who would naturally apply to dispen-

saries and hospitals for economic reasons. There is no need for us to attempt any change with respect to our private patients because we are already in a position to deal with them as we see fit. It has been suggested that clearing houses be established from which applicants can be referred to physicians or hospitals. There is much to be said for such a plan and yet will it not unduly draw public attention to a matter that had better be managed in a less open manner? Much thought and much consideration would have to be given to a project of this kind before the profession as such could lend its support. Consideration would have to be given by our special societies and perhaps by a conference of hospital managers with the leaders of medical thought and opinion.

In the meanwhile attention may be called to what has been done by our sister organization in Chicago, which under the terms of a resolution passed at one of its regular meetings made a personal canvass of its members and as a result published a series of very direct and plainly worded resolutions.

The substance of this investigation shows the Chicago Gynecological Society to be unalterably opposed to the public dissemination of contraceptive information, which should only be furnished by physicians either privately or in existing clinics and dispensaries. Special clinics for this purpose are believed to be neither necessary nor desirable, nor should nursing organizations be utilized for the purpose. It seems to me that the New York Obstetrical Society should undertake a similar canvass of its members and that a committee might likewise be appointed for the purpose of making such a study.

As I have attempted to bring out in my paper, we cannot as physicians avoid our responsibility in this matter. As a group we are legally empowered to render to our patients whatever assistance we can in the solution of their problems. We should not be expected to go beyond the point of propriety and reason in the giving of such advice and I believe firmly that as physicians we should object to the invasion of this field of medical practice by unqualified lay persons, which would result from the sweeping changes in the present laws on this subject.

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(For discussion, see p. 351.)

## PRENATAL CARE AS VIEWED FROM THE PUBLIC HEALTH STANDPOINT\*

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**I**N studying the question of maternity in this country, we are brought face to face with certain basic facts:

*First*, that the registration area, upon which the United States census for mortality and births is based, is far from complete and that there is an evident lack of uniformity in tabulating results. In the 1920 census, the death registration area included 34 states, the District of Columbia, 16 cities in nonregistration states (cities showing accurate registration in 90 per cent of all deaths) and the Hawaiian Islands, although the latter are not concerned in any figures that we may consider. In only two-thirds of these 34 states is there definite, reasonably accurate birth registration. It may be a surprise to some, moreover, that it was not until the year 1915 that such a birth registration area was established in the United States.

As illustration of what I call lack of uniformity in tabulation, I may cite:

a. The lack of uniformity in the registration of stillbirths. No definite, widely accepted standard as to what constitutes a stillbirth has as yet been accepted.

b. The United States mortality records for maternity are based entirely upon the number of *live* births and not upon the *total* number of births, while in a state like New York or in a city like New York, stillbirths are included with live births.

c. Records of the neonatal death rate, for the first two to four weeks of life, are almost unbelievably scarce; in other words, the records are still, in general, far from complete.

In the *second* place, even if we disregard the statements of the sentimentalist or the enthusiast in this field of social welfare, we are forced, I believe, to acknowledge that the general standards in this country, as applied to maternity, are still far too low and, furthermore we are forced to the conclusion that many of the dire results are dependent upon faulty methods of dealing with an unquestionably difficult problem.

The 1920 United States census showed a mortality of 80 per 10,000 live births, a figure surely much too high, while in New York State in 1921 there occurred 1,382 deaths of mothers connected with childbirth, or a rate of 50.9 per 10,000 live and stillbirths. There is positive

\*Read at a meeting of the New York Obstetrical Society, March 13, 1923.

reason for the belief that with improved prenatal and intranatal care, such figures can be very greatly reduced.

*Third*, one cannot but be impressed by the almost universally prevalent high death rate throughout the world from puerperal sepsis,—5,800 cases were reported in the United States census area for the year of the 1920 census, a rate of 27.5 per 10,000 live births. The number must have been very considerably larger than this, moreover, both because of incomplete registration and because many cases, no doubt, died long after delivery as a result of an obstetrical infection. In New York State 395 women died from puerperal infection in 1921, that is, about 30 per cent of the total number of maternal deaths. While poor care at delivery or just after will account for much of the sepsis, it does not account for all.

It is gratifying to know, however, that New York City stands well in the lead of other cities in the United States, in its percentage of septic deaths.

The *fourth* example of unsatisfactory care is to be found in the appalling wastage of infant lives as a result of abortions, prematurity, syphilis, bad management in labor and congenital debility—the latter so frequently dependent upon pregnancies occurring in too rapid succession. In 1920, 4.2 per cent of the babies born alive died under one month of age in the United States registration area. Including with this, the average stillbirth rate, we find that up to the end of the first month, actually 8.4 per cent of children are estimated to have lost their lives. Out of the 8,464 children who died in the State of New York in 1921, outside of New York City, 4,681 or over one-half did not live through the first month of life. In fact, of all the children, 2,008 or 24 per cent, did not live through the first day of life, and 4,124 or about one-half did not finish their first two weeks of life. This makes it clear according to the State Department of Health report, "that the dangers to the new born child are greatest immediately after it is born. Its security from sickness and death becomes greater with each day that it lives, therefore, efforts to prevent this loss of child life, to be highly effective, should be given to the mothers before the children are born, and painstaking care must be given the new born child, during the first few days and weeks of its life."

Of all the causes of early infant deaths, prematurity stands at the head of the list with 22.1 per 1,000 population under one year of age; congenital debility 8.9; injuries at birth 4.9 and syphilis 1. In the State of New York we find again that the chief cause of death in children under one year of age is premature birth. Out of the total 8,464 babies who died under one year of age in the up-state area, 26 per cent died as a result of prematurity. In a maternity welfare pro-

gram, education is the key-note to success and *prevention* the most satisfactory of all handmaidens.

In discussing the "value of prenatal care" in terms of mortality rates alone, obviously many faulty and incomplete deductions can be made. Gross mortality rates will include the whole period, from the first registration to one month postpartum, while "mortality rates" referred to, for the purpose of evaluating prenatal care, must of necessity be "*corrected ones.*" It is quite illogical to confuse the issue and to exaggerate the results of such care, remarkable as they are. Aside from the reduction in mortality rates, the actual saving in invalidism of both body and mind is immeasurable, by logical and scientific care during pregnancy and labor. The amount of such reduction unfortunately cannot be estimated on paper but the facts are so well known to all of us, in our own individual experiences, that there is little doubt that the same must hold true when dealing with greater numbers.

Prenatal care, as I have said, is primarily and foremost educational in character. It teaches the patient that while pregnancy is, *per se*, physiological, it may readily become pathological. It teaches the importance of early care and of early reporting, to either doctor or nurse, of all unusual symptoms. The patient should learn, moreover, before the birth of the child, the first lessons in the care of the newborn and the very great importance of maternal nursing. The more each individual patient comes in touch during her pregnancy with a competent social worker or nurse, trained in this special branch, the more likely will she be to demand the best care at delivery that the family budget will allow. The nurse or social worker going into the patient's home is an invaluable asset. We have already reached the point where we feel we cannot do without her; for after all, the more personal and the more human the contact, the more satisfactory will the results be.

From purely a medical aspect, the chief value to the mother, of prenatal care, rests upon:

1. The early determination of definite medical abnormality; of pelvic tumor or of other obstetric difficulty. In medical pathology, tuberculosis and Graves' disease seem to be most susceptible to the unfavorable effects of pregnancy.

2. The early detection and treatment of the toxemias of pregnancy. The diminution through prenatal care in the number of toxemias with or without convulsions, both as regards actual deaths as well as in the degree of severity, is so marked that this diminution alone will justify enthusiasm for the work. Nurses in particular may be so trained that they really become remarkably expert in detecting the early changes from the normal. It is the writer's belief that the pro-



fession, as a whole, does not as yet fully appreciate the extent of the damage to the patient's health, in this group of cases.

3. The early recognition of the importance of uterine bleeding. Here the one great lesson to ever bear in mind is the importance of all bleeding during pregnancy.

4. The detection of syphilis and, if present, vigorous antisyphilitic treatment. Hospital services and organizations specializing in the care of expectant mothers should make strenuous endeavor to carry out routine Wassermann tests. This is a great burden but results fully justify the effort required. Competent authorities have estimated that from 8 to 10 per cent of expectant mothers of the class that go to our public maternity wards give a positive Wassermann reaction. By treating specific mothers, a surprisingly large group of babies of these mothers will be saved—50 per cent at least. Gonorrhea is probably one of the most common causes for early abortion and should be carefully treated when discovered. Both stillbirths and neonatal death rates will be definitely influenced, therefore, by these measures as well as by the early recognition and treatment of the toxemias of pregnancy. So far as the offspring is concerned, prenatal care, and prenatal care alone, will diminish the shocking number of abortions and premature births. Owing to the lack of uniform standards in the classification of prematurity, virtually no reliable information is at hand as to just what the irreducible minimum can be.

In a campaign for prenatal care the need for clean, efficient delivery service should not be overlooked. The dangers to both mother and child in labor are very real. To the former the greatest are from hemorrhage and sepsis, to the latter from cerebral hemorrhage and pressure on the umbilical cord. As the Maternity Center Association, in its recent statistical study has so well shown, the best oversight during pregnancy may be vitiated from the standpoint of mortality statistics by unsatisfactory delivery results.

These, then, are some of the factors to be borne in mind as we turn to a brief survey of the methods dealing with maternity relief for the masses. Certain definite conclusions may safely be drawn from our study: *First*, the physician handling maternity cases should be required to possess greater knowledge than he does today and until such knowledge has been obtained he should be brought to the generous viewpoint that abnormalities demand the attention of the specialist and that such cases should preferably be treated in hospitals. This is the ideal to look forward to but, gentlemen, specialists in obstetrics and hospitals for maternity cases seem often impossible to obtain. Both are sadly lacking in large sections of this country and it is your duty and mine to use our best efforts to devise some method of relief. The hardest feature of obstetrical

consultation practice lies in the fact that all too often the specialist is not called in until virtually all chance of success has vanished.

In many ways, in large communities, we are highly favored and we are prone to forget the vast stretches and the several thousands of communities in which there is *not one hospital* excepting perhaps for the insane, the crippled or the tuberculous.

*Second*, the midwife is still an economic necessity in many sections of the country, but she should never be permitted to practice unless licensed and efficiently supervised.

My *third* conclusion, from studying this work is "that improved methods" for widespread prenatal care and follow-up work, are urgently needed.

The three agencies upon which the burden falls of supplying this need are:

1. Private welfare agencies, organized to promote safer maternity.
2. Maternity hospitals.
3. Municipal, state or the federal government.

*Lay Organizations.*—Lay organizations which have taken upon themselves the function of promoting public health in various lines, frequently become the target of harsh criticism. In matters pertaining to maternity, such criticism has at times been acrimonious and particularly was this true before the passage of the so-called Sheppard-Towner Bill. In the words of Dr. Briggs, "Such lay organizations, however, considered together unquestionably generate, conduct and apply a great volume of dynamic, democratic energy for the advancement of public health. The conviction is now generally held that the best services of private health associations can be rendered in the field of pioneering, experimentation and demonstration and especially in the education and direction of public opinion in support of the public authorities. On the other hand, we are agreed, I think, that matters of actual administration should be left to duly constituted health officials."

Among the conspicuous examples of lay organizations that are carrying on extensive and advanced maternity welfare work I might mention the Maternity Center Association of Manhattan; that of Brooklyn; the Visiting Nurse Association of Boston, and the Visiting Nurse Society of Philadelphia. These lay organizations must naturally have the strongest kind of medical backing and guidance. There is no question that they have been *primarily responsible for awakening* the public in general to the need of providing better supervision for the expectant mother.

*Hospitals.*—Hospitals with maternity services should be so organized as to meet the need of the community, as far as is possible. Obviously in very large communities they cannot accomplish this without out-

side assistance. In New York City, in fact, to rely upon the hospitals entirely would be impossible; then again, many cities of the second and third classes have no maternity services at all. Yet, I say, hospital authorities should be awakened to the need of developing a social service department, either with trained nurses or social workers, and each hospital should be willing to conduct each week, if necessary, at least one *open consultation clinic* for expectant mothers who need proper advice but who are to be confined in their homes by other than hospital aid.

Even in New York City, maternity hospitals have only had a reasonably adequate follow-up system for a comparatively short time, and to a limited number. In each hospital district there should be an outdoor service, to assist in caring for the large numbers who cannot or will not go to the hospital for delivery. Normal multiparae should be delivered at home. Such a scheme is expensive but it will add much to the value of the hospital in the community. To carry on such outdoor service, both students and nurses are necessary and students and nurses are not always available, particularly in the small cities. With properly equipped hospital services, with the demonstration of lay organizations and with active health departments, the ground can be safely and satisfactorily covered, but many towns and smaller cities—in fact some larger ones, have very backward health departments.

The question, however, which calls for greatest consideration and deepest thought is the situation present today in the vast rural districts and small townships which are poorly supplied with doctors, hospitals or nurses. The situation right here in New York State is, in many sections, unsatisfactory to put it mildly. Throughout rural sections practically nothing is being done except in a very few thickly populated counties, notably Erie, Dutchess, Livingston, Monroe, Nassau, Rockland and Westchester. In New York State alone there are, at the present time, many municipalities which have no physician and a number of cases have been reported where no physician could be obtained. Sometimes a nurse can reach these women but in most cases there are only members of the family or a neighbor in attendance. (Child Health Survey by Dr. S. Josephine Baker and Dr. Dorothy Kempf.) While time will not allow me to review the actual situation, I would impress upon you the fact that we who live here in a city like New York with a wonderful Department of Health and unusual hospital opportunities, fail to realize the extent of the need and the many difficulties in this branch of public health work. It is here that state or federal aid is being offered and in the writer's opinion, quite rightly. The help in general is *not help plus*

*dictation* so much as *help* offered through *education* and the *giving of assistance* when asked for.

New York State under the Davenport Bill has undertaken a wide educational campaign by means of health officers, public health nurses, pamphlets, moving pictures and actual demonstrations when called upon to give such demonstrations, by individual towns or municipalities. The physicians, mark you, are the leaders in this movement and have absolute control. This cannot be disputed, providing the situation is faced honestly. So far, New York State has preferred not to accept the provisions of the Sheppard-Towner Bill, but, as perhaps some of you know, a movement is on foot to change the state's policy in this respect and to accept federal money, providing the machinery, so ably set in motion by Dr. Hermann Biggs and Dr. Florence McKay, is not disturbed. The chances are, I understand, unfavorable to such action.\*

Up to November 1, 1922, 42 states had accepted, in general, the provisions of the Sheppard-Towner Act, six states had not. These are New York, Maine, Massachusetts, Rhode Island, Louisiana and Washington. Nineteen of the states accepted the provisions by legislative action and 23 by action of the Governor pending legislative action. It is not my wish to start a discussion regarding this Act. It is now on the statute books. But I myself do not hesitate to say that, so far at least as rural sections go, no improvement in maternity care will be brought about without some form of state assistance. The ideal development for rural sections as well as for small townships would be a centrally located hospital of moderate size which could be equipped in a thoroughly up-to-date yet simple manner with a small group of able, energetic, young practitioners who would have working with them a staff of district nurses and social workers. Such nurses should be trained by a special course in midwifery and should be able, where physicians are few and far between, to handle the normal cases. They should be able to recognize reasonably well, with practice, the presence of abnormalities and such cases would then, by calling an ambulance from the hospital, be rushed to the specially trained physician at the hospital. This scheme while apparently expensive is not at all impossible to develop. It is the only solution that the writer can see for the rural problem. If the municipality or the county will not awaken to such need and cannot afford the luxury of such service, then I say by all means let the state assist as long as it may be necessary until public awakening has reached the point that no further state assistance will be required.

In closing may I say one more word regarding possible state or

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\*Since the presentation of this paper, New York State has accepted the provisions of the Sheppard-Towner Bill.

federal assistance. There are many objections, particularly to federal assistance, but of this I am certain that at the present date, every effort is being made both by the states and the Federal Bureau in Washington to allow the medical profession to actively assist in the administration of its program. A serious handicap, however, is to be found in the fact that the average physician finds himself so hampered for lack of time, that his efforts all too frequently are of little avail.

162 EAST SEVENTY-FIRST STREET.

(For discussion see p. 351.)

### CONTROL OF MIDWIVES\*

By HAROLD BAILEY, M.D., NEW YORK, N. Y.

THE midwife problem has been frequently discussed during the last fifteen years and as a result some effect has been made in the control and restraint of these practitioners. Perhaps the greatest advance was made in England by the creation of the so-called Central Midwives Board. This governing body first came into control by an act of Parliament in 1907. At the beginning its authority was confined to England alone, but recently it has been extended to include Scotland and Wales. It is interesting to note that the Board was created for the purpose of "regulating, supervising and registering within due limits the practice of midwives." While the women who were already engaged in this pursuit were allowed to continue under the years of practice regulation, the new applicants are obliged to have two forms of training. First, they must be registered as nurses—following a regular course of training; and second—they are required to take a four months course in midwifery in which they, personally, deliver twenty women and attend a total of forty. Those who complete this training receive the title C. M. B. which means that they are registered by the Midwives Board. At first only a few nurses took the course but, at the present time, a very large number, probably in the neighborhood of 75 per cent, take this additional training. As each hospital with obstetrical connections was opened under the law for the teaching of these women, it became necessary to have the training, if one wished either to return to the hospital as a nurse or as a teacher, in any of the various training schools.

It is unquestionable that this regulation has greatly improved the condition in Great Britain by raising the standard and by providing close control of the women who act in this capacity. In France and

\*Read at a meeting of the New York Obstetrical Society, March 13, 1923.



Germany, for many years, midwives have had considerable training and have been under medical control.

The conditions in this country, for a long period, have been disgraceful, due partly to our attitude toward the situation and partly to the fact that these women are uneducated and untrained. In some areas their right to practice is denied and leaders of the profession who fully realize that it is impossible for the medical fraternity to handle all the obstetrical cases, nevertheless refuse to admit that these women should practice in a semi-medical capacity. This attitude has led to a surreptitious and unlawful practice on the part of the midwives. The midwife has felt that she was *persona non grata* with the doctor and has not uncommonly been insulted by him in any conference in which it was necessary that they come together. As a matter of fact the blame is all too readily placed on the midwife for the obstetrical difficulties that ensue in the course of abnormal labor. This has resulted in a condition of fear among these women, so great in extent that rather than consult a doctor in an emergency and possibly be charged with negligence or threatened with the revocation of their licenses, they allow the faulty conditions to drag along until life is endangered.

There are, however, some communities, even entire states, as a matter of fact, that fail to have any law for the control of these practitioners, or if they have such a law it has become a dead letter. It has been said that in Mississippi there are 5,000 midwives practicing illegally some of whom are black and white males. A personal desire to do so is the only requisite necessary to practice.

In New York in 1911 through the influence and personal energy of Dr. John W. Brannan, the Bellevue School for Midwives was started as a teaching institution. It is now the only institution for teaching midwives in this country. Previous to its foundation the schools existing were mere diploma factories. This school received a great deal of criticism and obstruction in its progress and only in the last few years has it received the proper recognition. However the City Health Board has been in harmony with the idea and it has refused to admit to practice any woman who is not a graduate of the School or of a similar school abroad. This stand has had a very decided result on the practice of midwifery in this city. The number of midwives has been reduced one-half so that now only 1500 are registered. The deliveries have been reduced from one-third to one-fourth of the entire number of parturient. Their handling of normal cases of labor has been conducted with fewer deaths of the mothers from sepsis and with as low a number of stillbirths and eye infections of the babies as in the cases handled by the medical profession. Crim-

inal abortion has diminished and a very small number of midwives have been charged with this or other misdemeanor.

A different method of control originated by the Bureau of Medical Education and Licensure, has been in vogue since 1913 in the state of Pennsylvania. The practical application of these regulations in Philadelphia is described by Nicholson. The plan requires the reporting of the midwives to an inspector within forty-eight hours after delivery and provides for the inspection by a medical officer of every baby and mother within the first few days. The local inspector is required to go as consultant when called upon by a midwife or, for abnormal conditions, she may call a private physician provided the patient can pay the fee. Lectures are given by the inspectors during the winter although the attendance is not compulsory; and twice during the year there is an inspection of the equipment of the midwives. In Philadelphia, as in New York City, a license can be revoked only for reasons that may be sustained in a court of law. In New York State, exclusive of New York City, the Legislature has given the Commissioner of Health the power to revoke licenses upon reasons that are satisfactory to him.

The question arises as to the proper qualifications for admission to this important practice and also as to the requirements for training. Are we able to train these women in a way to make their practice safe? After they have satisfactorily completed their training how are we going to hold them to the standards that they have been taught? It is possible that these questions can be satisfactorily answered.

Through the course of twelve years in our midwives' school, we have graduated 410 women. In the early part of this period the preliminary training was deficient, but by degrees the admission requirements were increased until now we have women of an intelligent grade. This year, of those who entered the School, ten were Americans, nineteen Italians and fourteen belonged to the German or Slav races. The graduates have formed an alumnae association which they manage themselves and which is semiscientific in nature. Of course, the more intelligent the woman is at the time that she enters the school the greater will be her value later. If we could do as the English have—that is train the nurses to act in this capacity—it would be one step forward but the peculiar conditions in America preclude the possibility of our nurses doing this kind of work in the tenements, because most of the women who wish midwives' services are foreigners who do not speak English and wish household aid as well as maternity care. An argument might be advanced for the employment of nurses in the sparsely settled regions of the country.

There is no doubt that the prenatal nurse employed by municipalities

should be trained as a midwife. One of her chief duties in the outlying districts is to aid in the instruction and control of those who are so licensed and the nurse is hardly fitted to do this unless she has an equivalent education. If in general practice we must select for students women who are untrained in nursing we should at least demand as an entrance requirement, a grammar school education.

How are we to train these women so that their practice will be safe? Our chief aim has been to train the women in aseptic technic. In order to provide sufficient practical instruction we have gradually lengthened the course until now it is of nine months' duration. For eight months the women serve in the indoor and outdoor departments and they are required to deliver twenty cases and to attend to at least seventy-five or eighty more.

In the School, under the charge of the resident doctor the women examine the patients in the prenatal and postnatal clinics and they receive a very thorough training in this type of work. They are permitted to make vaginal examinations on the antepartum women and to acquaint themselves with the outlines of the pelvis. The patient, however, is measured and placed in the normal or abnormal class by the resident surgeon. In the care of labor these midwives wear no gloves. They are taught to scrub their hands for ten minutes as it was considered that a soap and water sterilization would be more satisfactory than a constant putting on and off of rubber gloves. I personally believe the women should not only wash their hands thoroughly but they should be required to wear sterile rubber gloves. They are permitted to make one vaginal examination during the course of labor. The importance of the abdominal examination in obtaining knowledge of the presentation and position of the fetus is emphasized so that labor can be conducted with as great a facility from the abdominal examination as with the added vaginal.

The limited training of these women does not allow them to acquire much information from a vaginal examination. It must be recalled that in cases of delayed labor where the examination becomes necessary the infant's head is molded, distorted and edematous so that a mere touch examination would furnish very little information even to an expert. Rectal examination is not permitted because of the danger of breaking the aseptic technic and also because of real injury to the patient. Injury of the rectum may result or infection may occur through pushing the vaginal wall, in front of the examining finger, into the open cervix. From a study of the subject I am convinced that vaginal and rectal examinations should not be made by midwives.

We conduct our own service at Bellevue without permitting anyone to examine a case by rectum or vagina unless there is delayed

or complicated labor. We have been able in almost every instance, as is of course well known, to make a proper diagnosis and prognosis of labor. If we, as obstetricians, hesitate to examine the patient by vagina, why should we permit the midwives to do so? Probably by an examination no midwife would be able to help a woman in any way whatsoever. At once arises the question of failure to detect a prolapsed cord but prolapse of the cord occurs only about one in 250 labors and usually the prolapse occurs in deformed pelvis or in other abnormalities of position which would place the case at once in the hands of the doctor rather than the midwife. And, again, our experience has been that these cords prolapse through artificial and accidental rupture of the membranes by the examining finger, when the head is unengaged.

We believe that our methods of controlling these women while they are students at the school is ideal in every respect except that examinations are permitted. As an example of our results, we delivered 956 women in 1922 with no maternal deaths or infections and the stillbirths and neonatal deaths together were thirty-five per 1000 births. We have had even lower stillbirth rates in other years. Practically every mother nurses her infant and we know that this method is continued at home for the cases are followed for a period of six weeks.

#### MUNICIPAL CONTROL

The control of the midwives should be in the hands of local health boards. The supervision should be as close as the requirements in the School for Midwives. The women should be aided in the selection of their cases and they should not be permitted to deliver primiparae. Inspectors furnished by the city or community should follow up cases of delayed labor. Of course any such arrangement calls for a considerable amount of money but when we recall the infant mortality of the first month which including stillbirths is close to eight or ten per cent at the present time, why should not a municipality that spends millions for education spend a little for the preservation of life? A number of obstetricians must act as local inspectors and they must be men of the highest standards who have been selected through civil service examinations. They should be in charge of the health board maternity centers located possibly in infant feeding stations or maternity hospitals in the district. The health board at the present time lists forty-nine of these stations. Maternity nurses with a midwife's training should be used to follow up the cases and every parturient should be seen on the day of or the day after delivery, and an accurate report secured. This report should be made by the midwife on suitable blanks that are provided for the purpose.

*Prenatal and Postnatal Clinics.*—The midwife should be required by law to bring every patient to the health board's obstetrical prenatal clinic for the obstetrician in charge of the district to make a prenatal examination and prognosis of pregnancy and labor. The normal cases (and these should be only multiparae) are returned to the midwife for her care. But the primiparae and the abnormal cases should be referred to the hospital for care either on the indoor or outdoor service, unless the patient prefers to have a private doctor. During the prenatal period, if the midwife finds abnormal symptoms developing she should be required to report to the inspector for advice. During the labor period if twenty-four hours pass without delivery no matter what the diagnosis of fetal position, the case should be reported by the midwife to the inspector. The regulations should prohibit vaginal and rectal examinations. Every woman delivered by a midwife must be brought to a postnatal clinic for discharge so that the lacerations and malpositions may be diagnosed and proper advice given for future treatment. The health commissioner should have the power (as he does now in the State of New York, exclusive of New York City) to revoke the license of a midwife for infraction of any rule. Such regulations for midwives will be a great aid to the community where her work will be safely conducted for she will no longer be a pariah but a valuable member of society.

#### SUMMARY

The standard for admission to the training school should be high and nurses should be permitted to take the course if they intend to practice maternity work in public health positions. The practical training should consist in attendance at one hundred cases of confinement. The midwife should not be permitted to take primiparous women and she should be required to present all cases for a prenatal examination so that a proper diagnosis of pregnancy and labor may be made by a medical consultant. Vaginal and rectal examinations should be prohibited. All women in labor for 24 hours without delivery should be considered as abnormal cases. Consultation with a private physician or medical inspector should follow the deliveries conducted by midwives.

22 EAST SIXTY-EIGHT STREET.

(For discussion, see p. 351.)



## THE TREATMENT OF PELVIC INFECTIONS IN WOMEN\*

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**S**ERIOUS attempts to solve the problems met with in treating inflammatory conditions in the female pelvis date back only about one hundred years. During this time improvements in the treatment have been made possible by refinement in instruments and diagnostic methods, ability to control hemorrhage and the introduction of general anesthesia. The greatest advance has come with the understanding of the pathology of the disease and the study of infections and immunity.

What may be called the modern treatment of these inflammatory conditions is dependent on our present knowledge of the behavior of infections and immunity. That such knowledge is either not universally understood or is not accepted is shown by numerous articles written in the past few years advocating exactly opposite treatments for the same condition. Every large gynecological service constantly has admitted to its wards as patients, women who have been mutilated or made invalids for life by ill-advised operations performed by men either grossly ignorant or hopelessly dogmatic in their ideas. Therefore, it should be our aim to arrive at a safe and sane common ground in an endeavor to standardize the treatment of these common conditions.

For the sake of simplicity in discussion and treatment the infections will be considered under three headings: 1. Puerperal, including postpartal and postabortal. 2. Nonpuerperal, chief of which is the gonorrheal. 3. Tuberculous. This will cover most of the infections caused by the organisms usually encountered; namely, the gonococcus, streptococcus, staphylococcus aureus and albus and the colon and tubercle bacillus. The occasional case having as its etiological factor an inflamed appendix or diverticulum or a necrotic fibroid or twisted pedicle tumor is usually properly treated when diagnosed.

Before treatment is instituted a diagnosis of the probable etiology should be made. A careful history and a study of the situation and character of the local condition will usually reveal this. The puerperal thickening usually involves the parametrium, is hard and blends into uterus while the gonorrheal usually involves the tubes, is higher up, softer and more discrete.

\*Read at a meeting of the Section of Obstetrics and Gynecology, New York Academy of Medicine, April 24, 1923.

## PUERPERAL

Puerperal pelvic infections are primarily wound infections. The wounds may be in the vagina, cervix or endometrium. The infection having entered by whatever portal, advances more usually by way of the lymphatics. Unless the infection is too virulent and rapid, an exudate is thrown up by Nature in its attempt to stop the advance. Parametritis is therefore a frequent and favorable finding in these cases. If the infection starts from an infected endometrium or infected placental tissue it may spread through the uterine wall giving a lymphangitis or metritis. If it reaches the peritoneal surface a perimetritis or pelvic peritonitis is set up which may involve ovaries and tubes by contiguity. A pelvic exudate may form which may be able to stop the advance with spontaneous recovery or localization into a pelvic abscess. If the advance is not stopped, the peritonitis may become generalized. If the organism is very virulent it may advance so rapidly that the body does not have time to throw out its exudate and we may get a fulminating peritonitis or a general blood stream infection or bacteriemia. Less often the infection may extend from thrombi at the placental site along the venous route and give rise to a septic thrombo-phlebitis.

The basis of the modern treatment of puerperal pelvic infections is founded on the knowledge that these infections are, for the most part, general in character and that recovery is essentially by general systemic immunization against the infection. The local inflammatory exudate is not destructive in nature but conserving and protective. The relative part taken by the local and the general immunizing elements we do not know but the fact that some cases with no palpable local condition do recover would tend to show that in these cases immunization was mostly general.

The usual prophylactic measures which are familiar to all it is needless to recall to you. Let the patient approach labor in the best physical condition possible and with a sane, confident mental attitude toward the labor. Do not allow her physical and nervous reserve to be used up by a tedious and exhausting labor. At labor carefully observe the placenta so that you may know whether the uterus is empty should trouble later develop.

The real treatment of puerperal pelvic infections resolves itself into securing *proper drainage* and *constructive, supportive, constitutional measures* that will conserve and increase the immunizing forces of the body.

Drainage is secured by a high Fowler position with the patient lying on the abdomen at frequent intervals to prevent the posterior cupping of the uterus. Increasing the tone of the uterus further promotes drainage. The intermittent use of an ice cap over the fundus

and uterine tonic of ergot, quinine and strychnine every four hours helps to maintain the tone. This may be preceded by an initial dose of pituitrin if the case is seen early and the fundus is very boggy.

Constitutionally, fresh air and sunshine are priceless measures to be employed as in tuberculosis. This cannot be too strongly emphasized. Force water and nourishing liquid diet to the limit of assimilation. If there be nausea utilize the rectum. If there be diarrhea use frequent hypodermoclyses. Control excessive temperature by sponging and an ice cap; chills by hot blankets and water bottles. Secure rest and sleep by opiates if necessary. Restlessness, anxiety, fear and pain detract greatly, while a cheerful mental attitude is an important asset. Do not use irritating cathartics but secure elimination by enemata. A cheerful, conscientious nurse is invaluable in carrying out these details.

A patient admitted to the hospital and seen for the first time should receive careful observation and study in order to know the type and extent of the infection and the resistance of the patient. A complete blood count and blood culture are taken. Blood counts should be repeated whenever there is any change in the patient so that we may know better what is going on. One careful, gentle pelvic examination is made at which information as to the entire local condition is obtained and uterine culture taken if indicated. If there is hemorrhage it may be necessary to explore the uterus digitally, and if placental tissue is felt to remove it with placental forceps. If this is done the interior of the uterus should be swabbed with iodine. Iodoform gauze to stimulate contraction may be left in for 24 hours if the relaxed condition of the uterus so indicates. Some men would similarly explore the uterus whenever a foul endometritis is found. In an occasional case, in experienced hands, this might be advised but we feel that it is a dangerous tendency and generally practiced, more harm than good would be done and more lives lost than saved. Most of the worst types of infection seen have had some such manipulation by the outside doctor before the patient has come into the hospital. A sharp curet should never be used; to do so is criminal.

Parametritis or other pelvic exudate is let entirely alone and treated conservatively as stated above. The majority of them will clear up spontaneously. A small percentage will form an abscess, which usually points in the culdesac. This should be opened by posterior colpotomy but not until pointing is distinct. This is drained with rubber tube and iodoform gauze to either side of it or Bovee's parafinestearine gauze may be used. The cavity should not be irrigated and the tube should not be removed too soon. Any exudate persisting after the acuteness is past and the temperature has re-

mained normal will clear up more quickly by the exhibition of heat in the form of baking and hot douches followed by glycerine tampons.

In pelvic peritonitis endeavor by rest and posture to localize the condition. If it localizes and goes to abscess formation drain by posterior colpotomy as above. If it will not localize but is spreading to the general peritoneum, posterior incision and drainage may help.

General peritonitis is a fight between infection and immunity. The constitutional supportive treatment aided by hypodermoclyses and stimulation may turn the tide. The very virulent, fulminating type usually dies no matter what is done. In the less virulent types results are about equal whether treated surgically or conservatively. The same may be said of septic thrombophlebitis.

In bacteriemia we have to depend on the immunizing forces of the body to overcome the bacteria. Careful nursing and attention to detail in the constitutional treatment outlined above, is our main reliance. Vaccines do not seem to aid. Some men think that large doses of serum of the polyvalent type are of benefit. In severe types with low hemoglobin, repeated transfusions as advised by Polak may be used with benefit.

CHART I.—ADMISSIONS

YEAR	TOTAL	PUERPERAL INFECTIONS	NON-PUERPERAL INFECTIONS	ABORTIONS	TOTAL MORTALITY
1920	1773	70	294	442	34 (1.9 per cent)
1921	2091	89	312	601	32 (1.5 per cent)
1922	2039	64	290	608	32 (1.5 per cent)
Total	5903	223	896	1651	98 (1.6 per cent)

CHART II.—PUERPERAL, INCLUDING ALL TYPES OF POST-ABORTAL AND POST-PARTAL INFECTIONS

YEAR	NO. CASES ADMITTED	DEATHS	MORTALITY
1920	70	22	31.4 per cent
1921	89	16	18 per cent
1922	64	12	18.7 per cent
Total	223	50	22.8 per cent

During the past three years there have been admitted to the Gynecological Service in Bellevue Hospital, 223 cases of postabortal and postpartal infections. (Chart I.) This includes all cases of parametritis, peritonitis and bacteriemia. A number of cases were moribund on admission and survived less than twenty-four hours. Of the total 223 cases, 23 developed pelvic abscesses which were treated by posterior incision and drainage, without mortality. This gives an incidence of approximately 10 per cent. Fifty deaths give a total mortality of 22.8 per cent. The decrease from 31.4 per cent in 1920 to 18 per cent for 1921 and 1922 is worthy of note. (Chart II.) We think this is due to the fact that the entire staff is greatly interested

in these cases and they are studied more carefully and greater attention is given to the detail of carrying out the hygienic treatment.

#### GONORRHEAL

Gonococcus infection differs from puerperal infection in that it is essentially a mucous membrane infection and usually spreads by continuity of surface. As the infection reaches the fimbriated ends of the tubes, a perimetritis or local pelvic peritonitis is more often found, rather than a parametritis. However, in cases of endocervicitis, there is frequently found a varying amount of cellular infiltration of the utero-sacral ligaments and many cases develop a metritis.

Treatment of these cases will be divided into the acute and chronic groups. The subacute type is treated similarly to the acute.

Acute gonorrheal pelvic infections should never be treated surgically. Absolute rest in bed is the greatest essential. If there is evidence of peritoneal involvement the Fowler position should be utilized to aid in localizing the condition. Give a nourishing liquid diet and water freely by mouth. Pain is controlled by an ice-cap to the abdomen and salicylates and codeine. Cathartics are harmful and increase and prolong the symptoms. Mineral oil and small doses of milk of magnesia three times a day work well and enemas will not often be required. No local treatment is used while the condition is acute. It is astonishing how quickly the temperature and pain will subside if the treatment is rigidly carried out. Occasionally, we encounter a case where the pain and temperature persist. This usually means a mixed infection and treatment is prolonged. It is in this type of case that a pelvic abscess sometimes develops, from the localization of a pelvic peritonitis. When it is well developed it should be opened and drained by posterior colpotomy. Utilization of non-specific protein injections in acute cases may be tried. Gellhorn reports encouraging results from the use of sterile milk injections in acute and subacute cases.

Conservative treatment is continued until the condition is no longer acute and the blood count is normal. When the temperature has remained normal for one to two weeks and the patient is free of symptoms she is given a trial out of bed. As long as she continues so she is allowed to slowly resume her duties, being advised regarding coitus and bowel hygiene. She is instructed to use hot douches and is kept under observation. A good percentage will clear up and remain so, others will have exacerbations, usually due to failure to follow instructions.

Under chronic gonorrheal infections we include all cases having any residue of pathology after the primary acute attack has subsided.



The amount of pathology in different patients varies widely. There may be only an uncomplicated mild salpingitis or there may be extensive involvement of the entire pelvic viscera. The symptoms vary just as widely. There are all degrees from simple sterility to chronic invalidism.

The treatment of the chronic condition will depend on the symptoms, the social condition and the mentality of the patient. Nearly every case, after the first attack, is given an opportunity to carry on her usual routine. Mild cases with slight pathology who are in a position to carry out treatment may never require surgical interference. Cases with pronounced pathology or those with low mentality who cannot be taught hygienic living or those having to work hard for a living will be treated best by surgery. A very young patient whose fundus is in good position is often allowed to have two or three trials of conservative treatment before operation is decided on.

Surgical treatment having been decided upon, operation should not be done until the postulates as laid down by Simpson have been fulfilled. He has conclusively shown us that the mortality and morbidity will be materially lessened by following these guides. At this stage it is easier to distinguish between healthy and diseased tissue and rational conservative surgery can be carried out. Before this we are handicapped by having friable tissue to deal with. In consequence, careful peritonealization is often impossible and adhesions form which may give worse symptoms than the original disease.

At the time of operation what is to be done will depend on the pathology found and on the age and social condition of the patient. Our aim should be to remove the diseased tissue and yet preserve ovulation, menstruation and the reproductive function. Seldom can all these be done. While it is impossible to consider every contingency some guiding principles may be offered.

Possible sources of reinfection in the vagina should be cleared up by cautery or excision before laparotomy is begun.

A pronounced Trendelenburg position before the abdomen is opened makes operation easier, abdominal pads will seldom be required except to catch a doubtful spill and less trauma to the intestines will result.

All diseased or very doubtful tissue should be removed unless the patient has insisted that she would risk another operation for the sake of preserving some organ.

If only the tubes have to be removed, care should be taken not to interfere with the ovarian circulation.

If the ovaries are good and both tubes and uterus diseased, a partial hysterectomy of the Bell-Beutner type may be done.

If both tubes and both ovaries have to be sacrificed then the uterus, especially if it has much raw surface, should usually be excised. If the cervix is also diseased a complete hysterectomy should be done.

Where the uterus and one or both ovaries are left in, a prophylactic suspension of the uterus should be performed.

In very young women a doubtful ovary may be left in for the sake of preserving menstruation and internal secretion whereas in a woman near the menopause the same type of ovary would be removed.

Care should be taken, wherever possible, to peritonealize all raw surfaces.

#### TUBERCULOUS

Tuberculous involvement of the pelvic organs is most common in the tubes as an endosalpingitis or a perisalpingitis, the lesions being practically always bilateral. The uterus is next in frequency, especially the endometrium which seems rather susceptible to the tubercle bacillus. The ovaries are least often involved and are then usually secondarily infected from the tubes or peritoneum.

Pelvic tuberculosis is usually secondary to an infection in some other part of the body. The peritoneum is involved in about 60 per cent of cases that have tuberculosis of the pelvic organs. The infection is usually either a descending one or is hematogenous in origin. Many cases are associated with positive chest findings while others may have had chest lesions that have since healed so that it would appear as if the primary lesion was in the pelvis or the peritoneum. R. Peterson in a careful review of 100 cases of pelvic tuberculosis found positive chest signs in 25 per cent of the cases. In 44 of his cases in which total ablation was done, the tubes were involved in 86 per cent, the peritoneum in 66 per cent, the uterus in 50 per cent and the ovaries in 43 per cent.

The diagnosis of tuberculosis of the pelvis, uncomplicated, is not generally made before operation as the symptomatology is not unlike that of chronic adnexal disease of gonorrheal origin. If there is a tuberculous lesion elsewhere in the body or the patient is an undoubted virgin with intact hymen and has pelvic symptoms and adnexal pathology we would suspect the tuberculous nature of this pathology. Where the tuberculosis of the pelvis is associated with tuberculous peritonitis the diagnosis is not so hazardous. In this latter condition, however, we must differentiate between tuberculosis and malignancy. Many cases are first diagnosed or suspected at operation but the report from a careful laboratory study of specimen removed should be accepted as to the positive tuberculous origin of the disease.

**Treatment:** If a tuberculous pelvic infection is diagnosed or suspected a careful examination of the patient should be made to ascer-

tain whether there is any other lesion in the body. If so, consider the relative bearing of the lesions on the symptoms. Will the other lesion be made worse if the pelvic condition is treated surgically? General miliary or advanced pulmonary tuberculosis will certainly be made worse by operation. The hygienic treatment of rest, food, fresh air and sunshine will benefit and should be used in all cases whether it is the only treatment or a trial treatment while the patient is under observation or a convalescent treatment of a patient who has been treated surgically. In a case associated with tuberculous peritonitis, hygienic treatment may be tried as long as there is improvement as a fair proportion of these will subside spontaneously. Early cases with ascites deserve such a trial. If pressure becomes embarrassing, paracentesis, though it has a slight element of danger to an adherent gut, may be tried, especially if the general condition contraindicates an exploratory laparotomy. The routine treatment of opening and letting in the sunshine while still used has not the undisputed vogue it formerly had.

When operation is deemed advisable either originally or after conservative and hygienic treatment has been tried and justifiable symptoms persist it is done as in any other chronic pelvic infection except that we are inclined to be more radical and not leave any focus of infection. As the uterus is involved in 50 per cent of cases, hysterectomy is done in a larger percentage of cases than in chronic gonorrheal infections. Bilateral salpingectomy is practically always indicated and the doubtful ovaries cannot be spared. Intestinal involvement is best let alone, as the majority of cases improve after the pelvic disease is removed. Any injury to the intestines during operation is very likely to cause fecal fistula which usually resists every effort to cure. For the same reason a drain should never be inserted if it can possibly be avoided.

CHART III

	ACUTE AND CHRONIC CASES	CASES OPERATED	ONE OVARY ONLY SAVED	UTERUS ONLY SAVED	TOTAL ABLATION	UTERUS AND ONE OVARY SAVED	UTERUS AND TWO OVARIES SAVED	CERVIX AMPUTATED	PLASTIC	APPENDECTOMY	UTERUS SUSPENDED	DEATHS	MORTALITY
1920	294	100	4	2	27	47	20	30	23	47	55	3	3 %
1921	312	114	9	8	39	41	16	29	14	74	52	3	2.6 %
1922	290	97	3	4	24	52	3	24	17	45	49	1	1.03%
Total	896	311	16	14	100	140	39	83	54	166	156	7	2.2 %

In the past three years 896 cases of nonpuerperal pelvic infection have been treated on the Bellevue Gynecological Service. Of this number approximately two-thirds were chronic infections. A total

of 311 cases, mostly chronic, were subjected to operation after they were found to meet the conditions stated above. This gives an operative incidence of about 50 per cent in the chronic cases. With seven deaths there was an operative mortality of 2.2 per cent. Total ablation was done in 100 cases. Ovulation was preserved in 195 cases. One hundred seventy-nine (57 per cent) had ovulation and menstruation preserved, while a good percentage of these will be able to bear children. Endeavor was made to remove or repair all pathology giving symptoms. So it will be seen that plastic repair was done on 54 patients and 83 had a modified Sturmdorf amputation of the cervix. Patients having symptoms caused only by endocervicitis seldom require operation. Most of these can be cured by treatment with the electric cautery in the manner advocated by Dr. Holden. Some form of suspension was used in 156 (80 per cent) of the 195 cases having the uterus preserved. Appendectomy, most frequently prophylactic, was performed 156 times. The decrease in the mortality from 3 per cent in 1920 to 1.03 per cent in 1922 we believe is due to the realization and practice of the principles of treatment outlined in this paper.

#### CONCLUSIONS

1. In treating puerperal pelvic infections our aim should be to secure proper drainage and to utilize all measures that will increase the general immunity of the body against the infection.
2. Surgery is limited to the control of hemorrhage and the evacuation of pus in frankly developed abscesses.
3. In acute nonpuerperal infections we should employ rest, posture and hygienic treatment to localize the infection and increase the general immunity against it.
4. Chronic infections that continue to produce sufficient symptoms should receive operative treatment.
5. Operation should not be done until all evidence of the acute disease has disappeared.
6. At operation, in our endeavor to cure the patient, we remove or repair all pathological tissue preserving, if possible, all the normal functions of the body.

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(For discussion, see p. 356.)

## PELVIC INFLAMMATIONS, THEIR ETIOLOGY AND PATHOLOGY\*

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IN a general discussion of the etiology of pelvic inflammations, it is advisable to begin with a brief account of the bacterial flora that are normally found in the genital tract. This will help in explaining those rare instances of autoinfection that occur even under the most ideal of aseptic conditions. Investigations of the genital tract in the fetus have failed to show the presence of bacteria. Vahle<sup>1</sup> found that the vagina in the newborn was sterile during the first twenty-four hours of life, but that on and after the third day, he could always isolate strains of staphylococci and of streptococci. Stroganoff<sup>2</sup> has found bacteria on several occasions during the first few hours after the birth of the infant, and in a few rare cases, he has been able to demonstrate bacteria during the actual delivery of the infant. These latter instances consisted of breech deliveries. Other investigators have corroborated these bacteriological findings.

In the vagina of the adult, however, we are far from finding the same unanimity of opinion. Kroenig<sup>3</sup> has been unable to find any pathogenic microorganisms, excluding the gonococci, in the adult vagina. Walthard<sup>4</sup> made an intensive antepartum and postpartum bacteriological study of the genital tract in one hundred women. This investigator divides the tract into an upper noninfected portion consisting of the tubes, uterus and upper cervical canal, and into a lower infected portion consisting of vestibule, vagina and lower cervical canal. He has been able to isolate streptococci, staphylococci, bacillus coli communis and gonococci in the vaginal discharges. In twenty-seven per cent of his cases, he has been able to isolate the streptococcus. It is very important, however, to note that in testing out this organism, he found that it had lost its virulence. Inoculation of this strain into healthy animals gave negative results. Where,

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however, the vitality and resistance of the experimental animal were lowered either locally or generally, the inoculation of this same strain resulted in the production of abscesses, and in this manner the microorganisms regained all their former virulence. Burkhardt and Doederlein<sup>5</sup> found streptococci in the vagina of four and of four and one-tenths per cent of their cases respectively. Bumm and Sigwart<sup>6</sup> found them in as many as seventy-four per cent of their patients. Williams<sup>7</sup> in one group found twenty per cent of streptococci, and in a later investigation did not find any streptococci at all. He explained these apparently inconsistent findings by a difference in the technic employed in the two series of cases, and proved to his satisfaction that in the positive instances, the organism had been introduced from the external tissues by means of the speculum.

As far as the uterus is concerned, all investigators are in accord that the healthy nongravid uterus is free from bacterial contamination. The puerperal uterus, however, again brings us on disputed ground. In a study of fifty normal patients in Williams' clinic, Little<sup>8</sup> obtained the following results: Cultures taken immediately after the delivery of the placenta were found to be sterile in ninety-six per cent. Cultures taken on the third day postpartum were sterile in eighty-five per cent. Those taken on the ninth day were sterile in only seventy per cent. Stolz, Schieb, et al.,<sup>9</sup> found streptococci in thirty and thirty-eight per cent of their normal patients. The findings of Foulerton and Bonney<sup>10</sup> on the other hand were entirely negative along these lines.

In considering the problem of the diseased genital tract, it is necessary to study not only a large number of cases, but it is also essential to investigate the material of more than one clinic. The type of patient in one institution will often vary so very markedly from that in another, that a statistical study, especially of the etiological factors, will frequently show marked differences both in the type and degree of infection. Another factor towards which attention should be directed, is the frequent occurrence of sterile accumulations of pus making it impossible, from a bacteriological point of view, to determine the original infecting organism. Wertheim<sup>11</sup> in one hundred and sixteen cases of pus tubes, found sterile pus in seventy-two. Martin<sup>12</sup> had sixty-three sterile cases in one hundred and nine pus tubes. Liepmann<sup>13</sup> found aerobic microorganisms in only thirty-two per cent of his patients. In a series of four hundred and ninety-one patients admitted to the Mount Sinai Hospital for nonpuerperal pelvic infections, bacteriological study showed the following pathogenic bacteria: Gonococci, 6 per cent; streptococci, 9½ per cent; staphylococci, 3 per cent; tubercle bacilli, 5½ per cent; other bacteria 3 per cent. Figures taken from four other clinics give the following statistics.

	Mt. Sinai Hos.	Andrews <sup>15</sup>	Menge <sup>16</sup>	Pankow <sup>17</sup>	
Gonococci	6 %	43%	21%	23%	43%
Pyogenic	12½ "	24 "	4 "	3 "	22 "
Tubercle	5½ "	2 "	8 "	7 "	22 "

The variations in the figures can be explained first, by the differences in the types of patients, and secondly by the time of operation. It is well known that bacteria can be much more readily isolated from tissues and from pus obtained early in the course of inflammation. In the order of their frequency, we can say that the most important bacterial organisms found as etiological factors are the gonococci, the streptococcus and staphylococcus group, and the tubercle bacilli.

The duration of the life and hence of the virulence of the organism is of great practical importance insofar as the time of operation and the type of operation are concerned. The work of Curtis<sup>14</sup> is extremely valuable, especially along these lines. He showed that the gonococcus cannot as a rule be isolated from the tubes two weeks or more after the cessation of fever and after the disappearance of the leucocytosis. The streptococcus, however, he found could be isolated in its virulent form months and in some instances years after all clinical evidence of infection had disappeared. The tubercle bacillus is of course always to be considered as a source of constant danger. The method of treatment, therefore, must be decided upon both regarding time and type by a due consideration of the organism involved.

Before describing the pathological changes, it is advisable to say a few words regarding the paths of infection that the various organisms generally select. This is especially important because, although the bacteria in most cases select a path that is characteristic for that type, the changes proper are due not so much to the micro-organism as they are to the tissues involved. It is this which makes it impossible in a small minority of instances to recognize the type of bacterium responsible for the inflammatory changes. In most cases, however, one can readily tell from the nature of the pathological changes both macroscopically and microscopically, what the causative factor is.

The most common path of infection is that taken by the gonococcus. This consists of a direct passage along the mucous membrane of the genital tract beginning from below and ascending through the cervix, uterus, tubes and peritoneum. In this type the changes are found most marked along the mucous membrane of the organs involved. Here we have as characteristic changes endocervicitis, endometritis and endosalpingitis. The next most common path is that taken by the streptococcus group. Here the organism travels not

only along the mucous membrane but also through the lymphatic system and as a result the changes are found to be much deeper and to consist mostly of inflammation of the wall proper of the organ involved. The third or hematogenous path is occasionally taken by the streptococcus group in pyemic cases where the pelvis may become the site of a metastatic process. It is much more usually taken by the tubercle bacillus. The fourth or descending path is that which occurs when the infection travels from the abdominal cavity downwards through the tube. The most common instances are the spread of inflammation from a diseased appendix to the right adnexa and the development of adnexal tuberculosis from a tuberculous peritonitis. In this method the changes are mostly perisalpingeal and periuterine.

*Macroscopic Findings.*—In the acute stage the tube is hyperemic and thickened. The thickening will be found to occur more in the serosa or in the mucosa depending upon the path that the infection has pursued. When the tubes are open, the fimbria are seen red, erect and edematous. The tubal contents may be serous, sanguineous, caseous or purulent. The fimbriated extremity is often found closed with a resulting formation of a hydrosalpinx, pyosalpinx, etc. Discrete nodules are occasionally met with in the isthmic portion of the fallopian tube. These structures are formed by localized hyperplasia of the endosalpigium, the so-called salpingitis nodosa, or by small intramural abscesses. The peritoneal surface will in some instances of tuberculosis present small pin head sized grayish yellow opaque tubercles that are slightly elevated above the surface of the peritoneum.

The adhesions present rather distinct clinical characteristics. In the gonorrheal infections, they can be very readily separated by finger or by blunt dissection. Where sharp dissection is required, it is generally to be found that the gonorrheal infection had been complicated by some other pyogenic organism. In the tuberculous and in the pyogenic infections, the adhesions are very much different. They are dense, firm and more extensive. In their separation sharp cutting dissection is required. The intestines, adnexa and uterus are often firmly matted together, and in the process of separation, periovarian and periuterine abscesses are not infrequently opened. Where the process has lasted for some time, it frequently is noted that the inflamed tube and ovary had fused, and that the adjacent surfaces had become absorbed with the resulting formation of a single tuboovarian cyst or abscess depending upon the nature of the enclosed fluid.

*Microscopic Findings.*—According to Schridde,<sup>15</sup> in very early cases of gonorrhea, the tubal inflammation begins as an endosalpingitis. The mucosa is hyperemic and there is definite desquamation of the

epithelium. The tubal secretion contains polynuclear leucocytes and some lymphocytes and a few plasma cells. Gonococci can be demonstrated in the epithelium. In the later stages, the tubal folds are hyperemic, thickened and densely infiltrated with lymphocytes and plasma cells. When the desquamated areas of epithelium in the tubal folds come in contact with other desquamated areas, agglutination occurs and subsequently firm intratubal adhesions. As a result of the inflammatory stimulus, the epithelium at times proliferates profusely. When the edema recedes, the agglutination of the folds persists and in this way glandlike spaces and pockets are formed, producing a sort of tubal labyrinth. Schridde emphasizes the presence of the plasma cell not only in the tubal secretion but also in the wall of the tube proper.

This same author differentiates histologically, the gonorrheal tube from the streptococcus one. He describes two varieties of the latter. (1) Endosalpingitis purulenta where the tubal secretion contains pus rich in leucocytes and poor in lymphocytes and in plasma cells. Streptococci are found in the pus and not in the epithelium. The lymph vessels are free. (2) Lymphangitis purulenta. In this type the lymph vessels are filled with pus and contain streptococci. From these infected spaces, mural abscesses develop. Schridde also claims that agglutination of the epithelial folds is the exception in streptococcus salpingitis. Other pathologists maintain that histologically, there are no differentiating factors between the gonorrheal tube and the streptococcus tube. They claim that plasma cells, epithelial desquamation, and agglutination of the tubal folds do occur in these tubes just as they do in the gonorrheal tubes. In respect to these differences of opinion, Wolff<sup>16</sup> wisely emphasizes the importance that the path taken by the infection bears to the histological picture. In passing, I wish to call attention to the fact that, where the inflammatory processes have been of mild character, it is possible for a complete restitution to the normal to occur.

Oophoritis is usually part of a generalized pelvic inflammation, and has the same etiological factors bearing upon it. In rare instances, inflammation of the ovary may occur as an isolated pelvic condition, complicating pyemia or one of the acute infectious diseases—especially mumps. In these cases, the infection is a hematogenous one.

The appearance of an inflamed ovary depends entirely upon what portion of the organ is involved. The inflammation may be almost completely periovarian in nature. In this case, the ovary will be adherent to the neighboring structures and the adhesions will have the same characteristics as those of the tube, depending upon the variety of infection present. During the separation of the adhesions, small periovarian abscesses may be opened. Where the inner portion



is involved, the changes will be much more marked in the interior of the organ. The ovary will be soft, edematous and enlarged as a result of the hyperemic and exudative processes. The latter may be serous or purulent in character. When purulent, the ovary will be found to be the seat of an abscess. The course of an ovarian abscess is, in a way, similar to that occurring in the tube. It may become fused with the tube and form a tuboovarian abscess. It may perforate into the peritoneal cavity and produce general peritonitis. It may rupture into the vagina or rectum and empty itself in this manner. In other instances, it may produce septicemia with all the characteristics of that disease. In others, the abscess may become sterile and quiescent.

The tuberculous ovary does not differ materially in its pathological changes or in its course from a tuberculous tube of which it is generally an accompaniment.

There is another variety of pelvic inflammation that can be placed under the generic term of pelvic cellulitis. This consists of an inflammation of the connective tissue of the pelvis. The point of entry of the offending organism, which is in most cases the streptococcus, is usually a cervical laceration that is produced by instrumentation or by injuries following normal labor or interrupted pregnancy. The lymph spaces are invaded and the inflammation spreads through the lymphatics into the adjacent cellular tissue. The degree of involvement varies from a small localized unilateral inflammation to one that fills the entire pelvis. The conformation that is assumed by the inflammatory process depends upon the location of the inflammation and upon its extent. The pathological changes are the same here as they are in any other type of cellulitis. The tissues are extremely hyperemic and are infiltrated with round cells and with serous exudate. There is also a fibrinous exudate that gives to the tumefaction its typical hardness. Hardness and immobility characterize this type of inflammation.

The course pursued by the inflammation may lead to three different outcomes. The exudate even in extensive cases may undergo complete absorption and leave absolutely no trace. It may become almost completely resolved but leave a distinct scar in the pelvis, that results in a posterior parametritis, lateral parametritis, etc., depending upon the site of the original trouble. A third outcome is that in which the mass breaks down, usually in its very center, and is converted into an abscess. The abscess may be only the size of a walnut surrounded by a thick layer of exudate many times the diameter of the abscess, or the entire mass of exudate may be converted into one large abscess. The place of softening or in other words, that portion of the exudate which is first to undergo suppuration, bears an important relation to the method of treatment and determines whether the abscess is to be opened per vaginam or extraperitoneally above Poupart's ligament.



When the cellulitis is not a distinct entity, but is part of a generalized pelvic peritonitis or salpingitis, the ultimate outcome will depend not so much upon the cellulitis itself as it will upon the more important accompanying inflammation that may require treatment after the pelvic cellulitis itself had subsided.

#### CONCLUSIONS

In the order of their frequency, the organisms most commonly responsible for pelvic infections, are the gonococcus, streptococcus and staphylococcus, and tubercle bacillus.

The gonococcus lives but a very short time after the infection has become clinically arrested. The streptococcus, on the other hand, persists in its vitality for a considerable time after the clinical arrest of the inflammation.

The macroscopic picture, as represented on the operating table, allows a diagnosis to be made fairly readily in most instances.

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20 WEST FIFTIETH STREET.

(For discussion, see p. 356.)

## THE UTILITY OF DIGITAL DILATATION OF THE CERVIX\*

BY PAUL T. HARPER, M.D., F.A.C.S., ALBANY, N. Y.

**C**HOICE of the above subject is prompted by a desire to present the peculiar advantages of digital dilatation in induction of labor and its early progress. It is, therefore, a first-stage procedure that is being considered; and the discussion has nothing to do with digital or manual dilatation practiced on the incompletely dilated but dilatable cervix preliminary to operative advance.

At the outset it is insisted that its field is limited, and that what follows is not written in advocacy of digital dilatation in uncomplicated cases as a means of instituting labor or of making its advance more rapid.

Cases in which haste in delivery is imperative or is at least highly desirable, are fairly common and practically all of them are met in advancing toxemia. Rarely the indications arise in accidental hemorrhage and still less often when a "heart" gives promise of bearing the strain of unassisted labor poorly. Emergencies of the kind are not new and accouchement forcé occupies a place in literature as a method of meeting them.

But extensive traumatisms were done to cervix and lower segment by Bossi dilators and by little less efficient fingers, and a procedure, the purpose of which was promising, fell into disrepute because of unfortunate accidents attendant upon carrying out dilatation that was forcible.

Use of the hydrostatic dilator makes forcible dilatation impossible because it depends for its efficiency upon contractions of the uterine musculature that are intermittent; but, for the latter reason, its action is relatively slow. Further, contractions depend upon presence of the dilator in position and, accordingly, progressively larger dilators may have to be inserted if maximum progress in dilatation is secured. It is in cervixes in which the internal os has undergone little obliteration that these effects are most pronounced and, unfortunately, it is in just such cases that maximum speed in dilatation is often desirable.

The foregoing are definite limitations of the hydrostatic dilator. There is one actual disadvantage attendant upon use of the "bag" and it is met when introduction is followed by maintenance of general uterine tone. Cervix and lower segment are especially affected by the foreign body in firm contact with them, and progressive dilatation is retarded until increased muscle tone has passed off. It is true that such uterine

\*Read at a meeting of the New York Obstetrical Society, May 8, 1923.

overaction can on occasion be relieved by use of narcotics and anesthetics but it is apparent that the incidental delay is most undesirable in cases where speedy termination of pregnancy and labor are the ends in view.

The essential advantage in digital dilatation is more or less perfect control over advance that it offers. The latter begins when the operator chooses to have it, whereas, in hydrostatic dilatation, it is deferred in the presence of cervical tone and, when once started, is rapid or slow as the musculature responds with efficient or inefficient contractions. The dangers are the familiar ones of forcible dilatation and laceration.

All tone can be removed, dilatation facilitated, and the dangers of laceration reduced to the minimum if the precaution is taken to secure complete muscular relaxation before any attempt at dilatation is made. Relaxation of the kind begins in from 12 to 15 minutes after continuous administration of ether to the surgical degree is begun: it is complete in 20 minutes. At the latter time beginning pupillary dilatation can be detected and the cervix is found to present a surprising degree of dilatability. Within limits that thickness and inherent firmness of the cervix impose, the extent to which dilatation can be carried is determined only by strength of the operator's fingers and by the necessity for haste.

All that is required is dilatation sufficient to admit one finger and tip of a second, when progressive advance after the manner of Harris is possible. The procedure can be practiced in a cervix that is dilated sufficiently to admit a No. 2 Voorhees' Bag; and it is immaterial whether such preliminary dilatation has occurred spontaneously or has been brought about by use of a Goodell dilator.

With the Edgar method, where dilatation is begun by branched dilators and completed by the powerful tips of the first two fingers of both hands, the writer has had no experience. The procedure seems less physiological than the one earlier mentioned if for no other reason than because it attempts dilatation of internal and external os at the same time.

With proper sterilization of the outlet and with portion of the gloved hand coming in contact with the patient protected by a wet bichloride or lysol towel, the dangers of infection are no greater than arise from introduction of a hydrostatic dilator. They are even less in digital dilatation because time consumed in the business of dilatation is shortened.

Reasons for increased efficiency of digital over hydrostatic dilatation appear when "shape" of each dilating agent is compared with that of the dilating cervix. In the physiological mechanism of dilatation of the primiparous cervix, the canal loses its fusiform shape and becomes conical with beginning obliteration of the internal os. As the latter process continues, the "cone" with base uppermost becomes progressively broader and lower until, when complete obliteration is attained, apex is in relation with base and external os is in contact with present-

ing part. Forces bringing this about are outward and upward pull of the longitudinal uterine muscle fibers and downward and outward push of the intact bag of waters; and of the two the former is the more important because, by itself, it can accomplish dilatation when dilating efficiency of the bag of waters is lost through premature rupture.

Shape of the conical, hydrostatic dilator being fixed, there is no accommodation to changing shape of the dilating cervix; and the bag is forced downward and outward in an attempt at obliteration of the internal os and dilatation of the external at the same time. The mechanism is non-physiological; it is by so much inefficient; and it is thought to account for the fact that expulsion of a No. 2 Voorhees Bag for instance is rarely followed by continuation of contractions and spontaneous progress toward full dilatation.

On the other hand, tips of the dilating fingers separate after having passed through the external os and the dilating force they exert is directed laterally and primarily against internal os and lower segment. In this way the physiological mechanism of dilatation is simulated and satisfactory results are accomplished for this reason. Were the lower segment thin and the external os dilated sufficiently to admit two or more fingers, progress up to the point of full dilatation may be relatively rapid, the finger tips making possible the application of an efficient, centrifugal force to rim of the cervix.

There is less occasion for digital dilatation of the multiparous cervix for the reasons that spontaneous dilatation is more rapid in the first place and the hydrostatic dilator is a highly efficient means of artificial dilatation in the second. In multiparae, thinning-out of lower segment and dilatation of internal os and external os not infrequently take place at the same time; and to this variation from the purely physiological mechanism of dilatation the hydrostatic dilator is ideally suited.

Not the least advantageous feature of digital dilatation is the fact that facilities for practicing it are always available.

The types of cases in which digital dilatation promises most are pre-eclamptic toxemia and eclampsia in primiparae at or near term. Digital dilatation under deep ether anesthesia makes possible a high percentage of uneventful deliveries within minutes after the operation is begun; and the slightly increased hazards of anesthesia are believed to be more than compensated for by lowered fetal and maternal morbidity and mortality that more or less immediate delivery promises. In cases of the kind met about the seventh month, properly conducted digital dilatation can almost invariably be carried to a point where immediate vaginal section can be practiced.

Digital dilatation after the manner described is urged as a late first-stage procedure in spontaneous and otherwise uncomplicated premature labor when membranes rupture, in the presence of strong contractions,

before full dilatation. Here the compressible head bears the strain of complete dilatation poorly; and a short, uneventful second stage almost invariably follows complete digital dilatation.

In summarizing what has preceded it may be claimed for digital dilatation under complete ether anesthesia that it institutes and shortens labor in a class of cases where speedy termination of pregnancy is advantageous both to mother and to child, and that it accomplishes vaginal delivery with minimum risks of cervical and lower segment laceration. With such advantages possible, it is insisted the relatively slight dangers of infection and of untoward effect of the anesthetic may be unhesitatingly assumed.

289 STATE STREET.

(For discussion, see p. 364.)

### URINARY SYMPTOMS IN WOMEN DUE TO URETHRAL PATHOLOGY ONLY\*

BY ALBERT M. JUDD, M.D., F.A.C.S., BROOKLYN, NEW YORK

SINCE the author's attention, through his interest in vaginal palpation of the ureters, has been drawn to the symptom-complex of the urinary organs in women, he has been impressed by the numerous cases where the symptoms present might indicate bladder pathology but where no indications of such could be found. Neither could a study of the kidneys and ureters explain or clarify the case. In numerous cases of this type there has been some difficulty in introducing the cystoscope so that an instrument of smaller caliber than the usual size 26 had to be used.

In the usual study of these conditions, the cystoscopist has, it seems to the author, in the female considered the urethra only as a canal through which an instrument could be passed into the bladder.

In reviewing the literature on the subject, we find also a strange silence and poverty of thought, which in itself makes one pause. Many books on gynecology do not even mention stricture of the female urethra, or dismiss it with only a few words.

Careful study of his cases in the office has led the author to investigate, with the result that it is found that we have practically all the pathology presenting in the female urethra which may be found in the male. We have the same narrowing of the meatus, either congenital or acquired through injury of instrumentation or delivery, which, upon the advent of any type of infection takes on a new significance. This infection may be from a gonococcal invader, or from the even more common practice among women of wiping themselves from behind forward after urination, with resultant

\*Read at a meeting of the New York Obstetrical Society, May 8, 1923.



infection from one or more of the various bacteria normally inhabiting the vagina. Any of these types of infection may terminate in what the author has been led, through the collaboration of Doctor Lederer, pathologist at the Jewish Hospital, to call a desquamative urethritis. There is a white urethral discharge containing various bacteria, pus cells and epithelium, with a strawberry-like urethral mucous membrane, as seen through the endoscope, and a thickened and tender urethra on palpation. This in itself may result in stricture formation from superficial erosions, or frequently an infiltrate around the urethra itself. There may be areas with only the urethra invaded, which can be detected by the localized tenderness and thickening on palpation, or the pathologic process may extend throughout the entire length of the urethra. I do not yet know which type of infection is most apt to result in the infiltrate. The gonococcal variety of infection is at times seen when active, but, in the writer's experience, has been more frequently seen when subacute or chronic. Often there is an invasion of the surrounding tissue by a soft infiltrate, easily palpable and tender, with a granular condition of the mucous membrane of the urethra as seen through the endoscope.

The final result of any type of infection of the urethra, when localized to any portion of the urethra, is apt to be stricture formation, easily detected by the use of bougies.

None of the books published show the proper method of palpation and stripping of the urethra when searching for discharge. It can only be done by using the forefinger of either hand upon that extent of the urethra which lies above the symphysis, changing to the thumb when the symphysis is reached; supporting the hand by pressing the finger which has been used in stripping the upper urethra against the back of the symphysis and advancing the thumb from this point downward until the discharge appears at the meatus. At the same time the forearm is supported by resting the elbow upon your knee or thigh. If the finger alone is used, it will, ninety-nine times out of a hundred, slip, and the findings, or rather lack of findings, will deceive the examiner.

The same causative factors apply to chronic infections resulting in pathology in Skene's glands, or the third gland, described by the author in a former article, as located on the roof of the urethra near the meatus. Destruction of these glands with the actual cautery is found by the author to give the best results; and it is done by the introduction of a very small electric copper point, from above downward; in the case of Skene's glands, protecting the posterior vaginal wall from injury by previously placing a Sims speculum in the vagina, (the patient being in the dorsal position) and when the heated cautery point breaks through it will be caught by the speculum and not the posterior vaginal wall.

Why it is that the treatment of conditions in the urethra of the female, of which he has spoken, has been so neglected by medical men, the author himself among others, is absolutely unexplainable to the writer in the light of his present knowledge. The same conditions apply here as in the male, therefore, why not the same methods of treatment? For the granular urethritis we must apply a two per cent solution of silver nitrate directly to the parts invaded, through the endoscope. This cannot be done properly by the means of a syringe or medicine dropper. The technic is easily acquired. For the infiltrate the author advises the passage of a sound once in seven or ten days, with massage over the sound. And for the stricture, if very



Fig. 1.

narrow and hard, cutting with a long, narrow bistoury, or the use of an urethrotome and subsequent dilatation by sounds, or, if larger, the use of sounds as in the male.

The treatment of acute gonorrheal infections of the urethra in the female has never been properly attempted. The author, in his first attempts to improve his technic, used the old Valentine irrigator with a very blunt nozzle; first washing out the urethra the same as in the male, then overcoming by means of pressure against the meatus and a proper height to the reservoir, the cut-off muscle, allowing the solution to flow into the bladder, being retained for a short time and then being discharged; the same as recommended for acute gonorrhea in the male. The author found that in certain types of cases this would be unsuccessful because of his inability to overcome the cut-

off muscle. In those cases he first used the instrument here presented (Fig. 1) with the Wheeler nozzle attached to a Janet syringe. Finding that this caused considerable pain he later added the end of a small catheter which reaches a short distance within the urethra and does away with the extreme amount of pressure necessary where the only obstruction to the outlet is through the meatus. This has worked exceedingly well and painlessly. The author is having some of these types of instruments made in both metal and rubber.

The solutions are the ordinary ones recommended by the genitourinary surgeons. The one which is at present giving the greatest satisfaction to the author is acriflavine, 1:6000 to 1:4000. He has used mercurochrome and various other preparations. This is his routine at the present time, together with local endoscopic treatment.

The development of the technic requires considerable patience and one will have some failures in the beginning, but persistence will reward the one who gives it a thorough trial, with much satisfaction and appreciation over the ordinary methods.

This is an entirely new departure in the line of treatment of gonorrhea in the female. It is no improvement over the methods carried out by prominent genitourinary specialists in the treatment of this condition in the male; but perhaps it is at least as good as and better than the methods previously carried out in the treatment of gonorrhea in the female.

NO. 375 GRAND AVENUE.

(For discussion, see p. 362.)

## MANUAL EXTRACTION OF THE PLACENTA\*

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(From the Department of Obstetrics, Harvard Medical School).

**M**ANUAL removal of the retained or adherent placenta from the uterine cavity following pelvic delivery is reckoned among the most dangerous operations in obstetrics. This opinion is held because of the two principal dangers to which the patient is subjected: (1) Hemorrhage, which may occur before, during, or after the procedure; and (2) Infection, due to the implantation of bacteria from the vulva or lower vagina upon the placental site.

American and English obstetric literature yield little on which to base a quantitative opinion regarding the exact extent of these dangers. Among the few who make statements with reference to the morbidity and mortality of the operation, we find B. C. Hirst,<sup>1</sup> who says that adhesion of the placenta occurs once in 312 cases; that it is rarely complete; that it usually occurs in women who have had endometritis; and that it is often a consequence of syphilis. Many women, he says, die of hemorrhage, and about 7 per cent of sepsis. Polak,<sup>2</sup> in a paper on the management of the placental stage of labor, states that 10 per cent of cases with adherent placenta removed manually die of sepsis; that invasion of the uterus postpartum per vaginam is dangerous, and that in such cases, if the placenta is not found presenting at the external os, delivery should be completed by suprapubic extraperitoneal hysterotomy, with excision of the placental site or, if necessary, hysterectomy. In London, Bourne,<sup>3</sup> in a recent review of sepsis in the Queen Charlotte Hospital, found that of 154 cases of manual removal of the placenta, 54, or 35 per cent, developed some form of uterine sepsis.

The subject is much more widely discussed in the German literature. Bumm<sup>4</sup> in 1909 attributes a 10 per cent mortality to the operation of manual extraction. Zangemeister,<sup>5</sup> (Doederlein's Handb. d. Geburtshulfe), in 1917 gives figures from various sources, regarding incidence and results of the operation. Rogoff<sup>6</sup> in 1912, reporting the cases from the Imperial Moscow Maternity, not only tabulated his own figures, but also published those of other Russian and several German observers. The figures are shown in Table I.

From such statistics it is evident that manual extraction carries with it a considerable morbidity and mortality. Rogoff's figures are the best, and in a discussion of his corrected percentages he states

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TABLE I

	TOTAL CASES	MAN. EXT. PLACENTA	MORBIDITY	DEATHS	MORTALITY
Ploeger <sup>7</sup>		174	43%		
Koenigsberg <sup>8</sup>		185		12	5.5%
Leo <sup>9</sup>		329		20 (hem.) 6 (inf.)	6.1% 2.0%
Rosenthal <sup>10</sup>	12000	39	66%	2	13.0%
Littauer <sup>11</sup>	11000	1:186 (all del.)			11.0%
Hegar <sup>12</sup>					13.9%
Seyffarth <sup>13</sup>	9465	79	35%		3.6%
Mattheus <sup>14</sup>	5000	55			12.0%
Guttman <sup>15</sup>		100			6.6%
Baisch <sup>16</sup>		45			9.4%
Ahlfeld <sup>17</sup>	5800	53			
Michailoff <sup>18</sup>	220695	3877 (1:57)			
Agafonoff <sup>19</sup>		1:70			
Hugenberger <sup>20</sup>	8036	135 (1:60)			
Rogoff <sup>6</sup>	52011	1243	Gross, 15%, cases to 6½ months Corr'd, 9.36%, cases to 6½ months Gross, 30%, cases 6½ mos. to term Corr'd., 19%, cases 6½ mos. to term		0.37% 0.37% 1.27% 1.27%

his belief that the high morbidity and mortality of the operation are due largely to infection before admission to the clinic.

One or two more references were not amiss. Winter,<sup>21</sup> in a report of the Commission for Investigation of Puerperal Fever in December, 1911, stated that in 260 septic cases with a mortality of 33 per cent, 30 cases had had the placenta extracted manually, with a mortality of 46 per cent. Alletsee<sup>22</sup> in 1912 reported 131 manual extractions in 7125 births at the Munich Polyclinic 1908-1911, only counting cases from 28 weeks to full term. Of the cases where the indication for the extraction was recorded, 111 (94.9 per cent) were for bleeding, 5 (4.3 per cent) for retention, and 1 (0.8 per cent) for fever; 81 per cent were in multiparae, and of these 10 per cent had had a previous manual extraction. The morbidity was tabulated as, severe puerperal fever 13.7 per cent, slight puerperal fever 17.1 per cent, afebrile 61.5 cent. Nine cases (7.7 per cent) died, five of hemorrhage, four of sepsis.

What are the conditions which justify us in exposing a patient to the dangers of manual extraction?

(1) Hemorrhage, due to a partially detached placenta, uncontrolled by stimulation of the uterus to contract. This, if profuse or threatening, is a well recognized indication: the uterus must be emptied and given opportunity to shut down. Hammerschlag<sup>23</sup> measures the blood lost, and when it exceeds 700 grams manually extracts. Most of us, however, will not adopt such an arbitrary standard.

(2) Retention of the placenta in utero for a certain period of time without evidence of separation. Such separation may occur and yet the placenta be unexpressible, even under an anesthetic, due to me-



chanical obstruction to delivery, e.g., constriction of the lower uterine segment, or obstruction by myomata or polyps. Here the indication is obvious: to withdraw the retained placenta as soon as the nature of the imprisonment is ascertained. On the other hand, the retention may be due to failure of the placenta to separate from its implantation, albeit no pathological adhesion exists; or to the presence of a placenta accreta, of which such specimens as have been examined show a lack of the normal spongy layer of the decidua, infiltration of the muscularis with villi, a hyperplasia of connective tissue, and a shreddy degenerated musculature. These two types of retained placenta may or may not give rise to some hemorrhage according as partial separation does or does not occur.

(3) Incompleteness of the placenta as shown by the absence of one or more cotyledons from the delivered tissue, also, possibly, by the persistence of hemorrhage after the uterus is supposedly empty. In such cases one must remove the bit of placenta if hemorrhage persists; if there is no hemorrhage, it is nevertheless wiser to remove it at once while the uterus is relatively free of organisms than to allow it to remain to become the nidus for a future infection or to cause a hemorrhage some days later which may endanger the patient's life directly or as a result of sepsis from removal or curettage at that time.

(4) Certain cases of operative delivery where the general or local condition of the patient seems to indicate immediate complete emptying of the uterus. Such cases include difficult and destructive operations through a contraction ring, certain cases of placenta previa and separated placenta where further hemorrhage is to be avoided, and vaginal cesareans for any condition where rapid emptying of the uterus is desired.

Generally speaking, the only question arising under the above indications deals with the length of time one should wait before removing the retained unseparated placenta. At the Boston Lying-In Hospital it is customary to undertake manual removal one hour after the birth of the child only after attempts at expression and Credé under an anesthetic have been fruitless. The Germans advise a wait, varying according to the individual, from two hours (Fehling<sup>24</sup>) to indefinitely (Bumm<sup>25</sup>). Hammerschlag advised waiting 6 hours in private practice, and 12 in hospital cases. The uterus is invaded by bacteria after 24 hours, and the removal of the placenta after that time resulted in his experience in three deaths in succession of pyemia; in his fourth similar case he did a hysterectomy. Liepmann<sup>26</sup> reports two cases in which the placenta could be expressed only after waiting 10 hours, and voices the opinion that without bleeding no placenta should be manually removed. Polak<sup>27</sup> states that he has left a num-

ber of placentae in the uterus for from 24 hours to 5 days, where there has been no hemorrhage, and has invariably seen them separate without manual extraction. When there is hemorrhage, he goes a step further, packing the interior of the uterus plus the placenta firmly with iodoform gauze; this has never failed to control the hemorrhage and separate the placenta.

The difficulty in the problem of manual extraction lies in the fact that for whatever indication the operation is undertaken one can never know beforehand, in a large proportion of the cases, just what condition will be met after the extraction is begun. Separation and extraction may prove to be a very simple matter, one portion of the placenta may be tightly adherent to the uterine wall, or the condition may prove to be that of "true adherent placenta" which may cause death from shock, hemorrhage, rupture of the uterus, or all three, in the operator's vain attempts to find a line of cleavage between the weakened uterine wall and the placenta.

The subject of placenta accreta or increta has been considered in a number of German articles. Clinically the condition should always be considered as a possibility in any case where the placenta does not separate during the third stage, especially in the case which gives a history of manual extraction in one or several previous deliveries. Vogt<sup>28</sup> and Schweitzer<sup>29</sup> have described the gross and microscopic pathological pictures in the cases of placenta accreta cervicalis which they have reported. Dietrich,<sup>30</sup> in addition to describing his own case, makes a very interesting summary of the condition as reported in the literature. In all, 19 cases besides his own have been described, and in each the condition has been confirmed pathologically. All the cases have shown a decidua basalis either entirely lacking, or imperfectly developed, with no trace of a spongy layer. The villi in each case were developed up to and in several instances into the muscularis, which was usually degenerated and characterized by an irregular overgrowth of connective tissue; in Dietrich's case the patient died of internal hemorrhage caused by the villi eroding through upon the posterior surface of the uterus, while the entire fundus and the posterior wall were almost completely replaced by placenta, with only a peritoneal covering in places.

The etiology of the condition is believed to be an atrophy, termed by Zweifel<sup>31</sup> "exhaustion" of the endometrium, from which during pregnancy is developed either no decidua at all, or at best one very incomplete. Such atrophy may be due to rapidly repeated pregnancies, previous abortions, manual extractions, or to various forms of endometritis. All the cases reported have been in the multiparae. Moreover, cervical and lower segmental implantations of the ovum

are more apt to give rise to placenta accreta because of the relatively scant decidual reaction in these regions.

The treatment of placenta accreta, as summarized by Schweitzer and Dietrich in their papers, has been a mournful chapter in obstetric therapeutics. Practically all of the cases in which manual removal was attempted died, the majority with unremoved portions of placenta left behind. Although Ahlfeld<sup>32</sup> has reported one case in which he packed a uterus containing an unremovable fragment which later came away when the packing was removed, tamponade was in most cases a futile resort, as the injured uterine wall had lost its contractility and soon bled through the pack. Two cases died following vaginal hysterectomy, of which one was that reported by Schweitzer. Only two cases of the 20 lived.

Both Dietrich and Schweitzer advise tamponade only as a provisional measure, to be followed by abdominal hysterectomy as soon as the operator has convinced himself that he is dealing with a placenta accreta. Kellogg<sup>33</sup> believes that such cases are seldom in shape to stand operation of this nature, and advises packing the uterus very tightly with gauze. He states that several cases handled by him in this way after unsuccessful attempts to extract the placenta manually have had the bleeding controlled; that removal of the pack twelve to twenty hours later has not resulted in further bleeding, and that the placental tissue has eventually come away in the lochia. In contrast to this view Schweitzer states that packing merely postpones the issue, as subsequent bleeding is well-nigh inevitable; that furthermore, should the patient survive and again become pregnant she is practically certain to have a recurrence of the condition.

To avoid manual extraction of the unseparated placenta with its high rate of morbidity and mortality, Gabastou<sup>34</sup> of Buenos Aires in 1914 published an article dealing with "hydraulic" removal of the placenta. His method, similar in principle to that described by Asdrubali<sup>35</sup> in 1826 and by Mojon<sup>36</sup> in 1827, consists in injecting warm physiological salt solution into the placenta through the umbilical vein. The solution fills the placental vessels, ruptures the capillary walls, and forms a "retroplacental hydroma." Separation of the placenta then takes place by the mechanical action of the hydroma and by the stimulation of the uterus by its heavy swollen contents. Traugott<sup>37</sup> has written several articles in enthusiastic appreciation of the Gabastou method, quoting 5 cases in 1916 in which placentas retained 70 minutes to 15 hours were easily removed; in two of them bleeding from partial separation was effectively checked. By means of the method, furthermore, in the Frankfort clinic, the ratio of manual extraction was reduced from  $4\frac{1}{2}$  cases per 1000 from 1911-15 to  $1\frac{1}{2}$  in 1916. Sklavounos<sup>38</sup> recommends the method, but says he has no figures for placenta accreta. Schwartz<sup>39</sup> reports the method suc-

cessful in 11 of 16 cases in 1919; two of the five unsuccessful cases proved to be placenta accreta, while the author states that the method was unsatisfactory in his experience for combating hemorrhage.

To attempt to arrive at some idea of the morbidity and mortality of the operation of manual extraction at the Boston Lying-In Hospital, the writer has searched the records for the ten years from 1911 to 1920, inclusive. During that time, in 8182 hospital deliveries by the pelvic route the placenta was manually removed 170 times, an incidence of 1.48 or 2.07 per cent. Of these 170 cases, 14 died shortly after delivery, giving a gross mortality of 8.2 per cent. On the other hand, of the 14 cases dying as the immediate result of delivery, 3 died of the terminal heart failure of eclampsia either on the table or shortly after being put back to bed; 1, a chronic nephritic, with hypertrophy and dilatation of the heart, died suddenly  $4\frac{1}{2}$  hours after delivery; 3 were previas, delivered by accouchement forcé and dying 50 minutes to 6 hours postpartum despite stimulation; 1, a uterus ruptured before admission; 2 of ruptured uteri following difficult deliveries; 1, of shock and hemorrhage 20 minutes after delivery by embryotomy and craniotomy through a contraction ring.

Of the three remaining cases, two died as a direct result of manual removal of the placenta and may well be described here. The third died of the hemorrhage necessitating manual extraction plus the extraction itself.

1. Case 24043. Para. 10. Age 38. No physical abnormalities. Full term. Vaginal examination revealed complete previa. Manual dilatation and extraction. Attempted manual extraction of the placenta, which was firmly adherent to the cervix, and lower uterine segment, thinned out, and spread over most of the uterus. Much like fibrous tissue. Placenta incomplete, and hemorrhage profuse. Death of shock and hemorrhage 5 hours after being put to bed.

2. Case 24172. Para. 1. Age 26. No abnormalities save question of mitral regurgitation. Full term. Low forceps delivery. Extraction of placenta after 1 hour and four attempts to Credé. Patient went into shock. Placenta very adherent, removed completely. Very fibrous with many infarcts. Patient died of shock and hemorrhage  $2\frac{1}{2}$  hours after delivery.

3. Case 25948. Para. 5. Age 37. Four previous normal deliveries. Delivered in O. P. D. at term by version after attempted forceps. Sent to hospital for third stage because of shock, hemorrhage, and partially adherent placenta. Placenta extracted manually 5 hours 20 minutes postpartum, probably not complete. No tear of uterus found. Patient transfused. Died 24 hours postpartum of shock, hemorrhage, and cardiac dilatation.

The corrected mortality, then, is 1.76 per cent of cases, dying from a combination of conditions demanding manual extraction plus the extraction itself. Of these cases the first was undoubtedly one of placenta accreta.

The incidence of uterine infection in the 156 remaining cases

amounted to 39 cases or 25 per cent. As a control, 3012 routine successive deliveries were studied from the same standpoint, beginning in 1913, and extending over four years. Cases of abdominal cesarean and manual extraction following pelvic delivery were omitted. Furthermore, inasmuch as the risk of infection depends in a measure upon the method of delivery, the cases have been divided into the groups suggested by Kellogg<sup>10</sup> in his paper on toxemia and sepsis.

As pointed out by Kellogg, the question of what constitutes sepsis differs with the individual observer. For the purposes of this paper those cases have been selected as infected which show a temperature of 100.4 degrees or higher at any one or more bi-daily readings, where there is noted a concomitant variation in the uterine consistency or involution from the normal, or alterations in the lochia.

TABLE II

	3012 CASES IN CONTROL SERIES			156 CASES MAN. EXT. PLAC.		
	TOTAL	INFECTED	%	TOTAL	INFECTED	%
Group 1 Normal delivery, or low forceps after complete natural dilatation	2612	123	4.7	50	13	26
Group 2 Dilatation by Voorhees bag followed by any type delivery	134	23	17.1	28	5	17.8
Group 3 Mid or high forceps, or breech extraction, following natural dilation	198	17	8.5	22	6	27.2
Group 4 Manual or instrumental dilatation of cervix, followed by any type delivery	64	10	15.	48	13	27.
Group 5 Vaginal Caesarean section	4	1	25.	8	2	25.
Whole Group	3012	174	5.7	156	39	25.

The results of this are shown in Table II. They indicate that one in every four manual extractions shows evidence of uterine infection postpartum, and that the method of preceding delivery, so important in the control cases, makes very little difference in the outcome. Several German authors differentiate their infected cases into those "with light resorption fevers" and those with "pyemia." In the present series no such definite division can be made, but the cases have been divided arbitrarily into groups of mild and severe infection. In the mild group are included those in which the temperature reaches 103 degrees only once if at all, and with definite rapid improvement as the result of ice, ergot, and drainage; in the severe group are placed such cases as show a temperature reaching or ex-



ceeding 103 on two or more bi-daily readings, and which, despite treatment, run a prolonged course. These cases are shown in Table III.

The fact that the percentage of severe infections in the manual extraction group is only about one-third of that in the controls makes it seem possible that retained portions of placenta or membranes in the former cases may give rise to a sapremic infection following many of the deliveries. The ease with which placental fragments and bits of membrane are left behind in normal labors, where the placenta and membranes are recorded as "intact and complete," and the frequency with which such cases pass bits of retained secundines several days after delivery, make it much more likely that portions of the lacerated placenta which has been manually removed, or of its membranes, have been left behind.

TABLE III

CONTROL SERIES 1893 DELIVERIES								156 MANUAL EXTRACTIONS		
GROUP	CASES	INFECTION CENT	PER CENT INFECTION	SEVERE INFECTION	PER CENT	DIED	PER CENT	PER CENT INFECTION	PER CENT SEV. INFECTION	PER CENT MORT.
1	1623	75	4.6	25	33.3	4	5.33	26	7.69	0
2	70	13	17.1	3	23.1	2	15.3	17.8	20.	0
3	153	11	7.1	2	18.1	0	0	27.2	0	0
4	43	6	13.9	1	16.6	1	16.6	27	15.38	7.60
5	4	1	25.	1	100.	0	0	25	0	0
Whole	1893	106	5.59	32	30.1	7	6.6	25	10.2	2.56

Only one case died of infection in the group of manual extractions, No. 22880. She had had some sort of operation by her local physician and was sent in with ruptured membranes and a transverse presentation. Manual dilatation and extraction of a macerated fetus was done, and her uterus, ruptured, was packed after removal of the

TABLE IV

	CASES	INFECTED	PER CENT	SEVERE INF.	PER CENT	DIED	MORTAL
1. Hemorrhage group*	66	18	27.2	2	11.1	0	0
a. Antepartum (not previa)	11	4	36.3	0	0	0	0
b. " (previa)	32	10	31.2	2	20	0	0
c. Postpartum	23	4	15.2	0	0	0	0
2. Retention group	51	11	21.5	1	9.0	0	0
a. Totally adherent	10	4	40	0	0	0	0
b. Partially "	11	3	27.2	1	33.3	0	0
c. Retained	6	2	33.3	0	0	0	0
d. Unclassified	24	2	8.3	0	0	0	0
3. Incomplete group*	9	3	33.3	0	0	0	0
4. Group removed routinely and for reasons unspecified	30	7	23.3	1	14.2	1	14.2
Whole group	156	39	25.	4	10.2	1	0.64

\*There were 7 cases of partial adhesion in the hemorrhage group, and one among the incomplete.

placenta. She died of peritonitis on the fourth day. The outcome of this case, certainly, can hardly be charged alone to the manual extraction.

Regarding the morbidity of these cases classified according to the indication for manual removal, we find the figures in Table IV.

Here again, there is but little difference in the morbidity, save in the increase of infection in the cases in which the placenta was known to be incomplete before the uterus was explored for missing fragments. So far as this proves anything, it indicates the probability of infection, sapremic (?) of unremoved fragments.

The series of deliveries in the Out-Patient Department of the hospital for the same period of time, 1911 to 1920 inclusive, yields a total of 16,486, in which are comprised 60 cases where the placenta was manually removed. Of these cases four died, giving a mortality of 6.6 per cent. A short account of these fatal cases follows.

1. Case 3953. Para. 2. Age 32. History of adherent placenta in her first labor. Showed general edema and albuminuria. Full term. Normal multiparous labor. Manual extraction 2 hours 5 minutes after birth of child, after several unsuccessful attempts to Credé. Placenta removed in pieces. Hemorrhage not recorded. Pulse became imperceptible 5 minutes after delivery of placenta, and patient died.

2. Case 8451. Para. 7. Age 35. Full term. Delivered by version for brow presentation and antepartum bleeding; the latter was found to be due to a spontaneous rupture of the uterus. Placenta was removed manually as a routine, and uterus packed. Patient died of shock and hemorrhage en route to the hospital.

3. Case 35660. Para. 2. Age 23. Fullterm. Normal multiparous labor. Manual extraction of placenta undertaken 1 hour 45 minutes after birth of child. Placenta found firmly adherent. It was removed in pieces. Uterus soft, not contracting well, and hemorrhage profuse. Despite packing patient died 3¼ hours after birth of child.

4. Case 38083. Para. 1. Age 17. Full term. Low forceps delivery. Manual extraction of placenta undertaken for hemorrhage 25 minutes after birth of child. Placenta removed complete, membranes intact, without recorded difficulty, and hemorrhage ceased. Patient, however, died of acute cardiac dilatation one hour and 35 minutes after delivery of the placenta.

Of the above cases the second died as a result of rupture of the uterus, which was in no way contributed to by the manual extraction of the placenta. The first and third were probably placenta accretae, although not proved by autopsy. The fourth probably died as a result of the hemorrhage necessitating the manual extraction. The corrected mortality, therefore, is 5 per cent.

Of the other 56 cases, the record of one is incomplete as regards the temperature chart and postpartum notes, although it is known that the patient was discharged from care obstetrically well. The morbidity of the remaining 55 cases is reckoned in Table V; Table VI shows grouping according to indication.

TABLE V

	CASES	INFECTED	PER CENT	SEVERE INFECTIONS	PER CENT	DEATHS
Group 1	40	16	40.	0	0	0
“ 3	12	5	41.7	0	0	0
“ 4	3	2	66.6	1	33.3	0
Whole group	55	23	41.8	1	4.3	0

TABLE VI

	CASES	INFECTED	PERCENT	SEVERE INFECTIONS	PERCENT
1. Hemorrhage	20	9	45.	1	11.1
a. Antepartum	1	1	100.	1	100.
(previa)					
b. Postpartum	19	8	36.8	0	0
2. Retention	35	14	40.	0	0
a. Total adherence	5	3	60.	0	0
b. Partial adherence	4	2	50.	0	0
c. Retained	11	1	9.	0	0
d. Unclassified	15	8	57.1	0	0
Whole Group	55	23	41.8	1	4.3

The percentage of infection is naturally higher in the Out-Patient cases than those in the hospital, inasmuch as the former are delivered in their homes, often under most adverse circumstances as regards hygiene and cleanliness. Furthermore, they are delivered, except in instrumental and other operative cases, by third and fourth year students, who follow the progress of the case by vaginal examinations. Notwithstanding this, the percentage of severe infections is remarkably low, and in no case did a patient die of infection following manual removal of the placenta.

The foregoing survey would seem to justify the following conclusions.

1. Manual extraction of the placenta following pelvic delivery carries with it the possibility that the operator may in any case find himself dealing with a condition, placenta accreta, in which the patient's life may be rapidly endangered from shock and hemorrhage.

2. Clinically placenta accreta occurred three times in the Boston Lying-In Hospital series; once in 8182 pelvic deliveries in the hospital, and twice in 16486 deliveries in the Out-Patient Department, or once in 8223 deliveries. Unfortunately, no autopsy was secured to prove the diagnosis pathologically.

3. No certain method has been found by means of which the presence of a placenta accreta can be foretold. Not until the operator begins the actual extraction can a definite diagnosis be made. "Adherent placenta" is, from a clinical standpoint, a relative term. No prediction can be made in any case of retained unseparated placenta whether one will find a placenta which is "easily peeled off," one which is "firmly adherent and has to be dug from the uterine wall," or one which is so blended with the uterine wall that no line of

cleavage can be made out. This may be as true of placentas partially detached as of those entirely unseparated.

4. One case in four of the hospital cases, two cases in five of the Out-Patient deliveries, showed some degree of uterine infection post-partum. This is an incidence almost five times that occurring in control pelvic deliveries in which the placenta was not manually extracted, so far as the hospital cases are concerned; and although no control series is practicable for the Out-Patient cases, the difference in surroundings and management would seem to account largely for the differences in results. Certainly the hospital and Out-Patient figures are remarkably parallel.

5. Such infection as occurred in these cases was usually of a relatively mild type. Only in one case, a hospital delivery where the uterus was ruptured, did death occur in this series. It seems probable that most of the infection which occurred was attributable to some degree of retention of secundines.

6. Results of the Mojon-Gabastou method of umbilical vein injection make the procedure one of choice to be used in the case of retained unseparated placenta without hemorrhage. It also deserves trial in cases where partial separation with slight hemorrhage has occurred, but it cannot replace manual extraction in the case of a brisk hemorrhage, where prompt action is necessary. Whether injection will separate and bring away a placenta accreta is questionable.

7. In the case of retained placenta in which injection has not produced separation within two hours of the birth of the child, manual extraction is indicated. We have had no experience with the method of letting such cases alone, nor with the method of packing the uterus on top of the placenta.

8. Manual extraction in such cases is ordinarily carried out without great difficulty or danger to the patient. Should separation of the placenta prove impossible or so difficult that placenta accreta is diagnosed, attempts at removal should at once be abandoned, the uterus packed tightly with gauze as an emergency measure, and laparotomy with hysterectomy performed, with transfusion before, during, or after the operation as the patient's condition indicates.

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443 BEACON ST.

## LACTATION ATROPHY OF THE UTERUS

BY HELIODOR SCHILLER, M.D., F.A.C.S., CHICAGO, ILL.

ONE of the first to describe this condition extensively was Frommel. He considered lactation atrophy of the uterus an abnormal hyperinvolution and was of the opinion that loss of nutritive bodies through prolonged lactation was the cause of this peculiar and not infrequent condition. He claims that weakly, poorly nourished, hard working, prematurely aged mothers are more often affected. Frommel distinguished between excentric and concentric atrophy and found the latter with a shorter uterine cavity, the more frequent. He believed that the prognosis concerning restitution of a well developed lactation atrophy is bad.

In contrast Simpson, Fränkl, and Thorn, especially the two latter, believe that nearly every uterus of an amenorrhoeic, lactating woman becomes more or less hyperinvolved. Thorn is of the belief that this condition, which disappears not later than six weeks after weaning, is normal and physiologic, about two-thirds of all lactating women should show it, and that it becomes pathologic only by reaching an abnormal degree, especially by extending to the cervix, the ovaries and the suspensory apparatus of the uterus and by the appearance of pronounced general symptoms. Thorn believes that the constant contractions in the uterus occurring during the act of nursing as a reflex action from the nipple should be primarily the etiological factors in the lactation atrophy. Normally the uterus of a nursing mother shows much quicker involution than of those not nursing. The loss of nutritive material during nursing should also be responsible, therefore, its frequent occurrence in weak, undernourished mothers with an irritable vegetative and vasomotoric nervous system. Contrary to the common belief, he holds the menstruating nursing mother the better nurse than the amenorrhoeic one. Both he and Fränkl do not advise weaning the baby on account of atrophy, but believe in



interrupting lactation at once if the cervix shows decided signs of atrophy and if the general symptoms are marked.

Lactation atrophy should not be confused with the irreparable atrophies of the uterus observed in the puerperium after severe infections as described by Ries.

Foges opposed the theories of Thorn and Fränkl and stated that the atrophy of the uterus during nursing is independent of the act of lactation, that is, its reflex action, but is produced by an arrest, or, as Novak puts it, by a temporary deficiency of the ovarian function. Temporary or relative amenorrhea and relative sterility during lactation are a fact and certainly only to be explained by a dysfunction of the ovary.

What is the cause of this ovarian deficiency,—is it a reflex action from the mamma, trophoneurotic, is it a chemical action, hormones, from the mamma, restraining ovulation, does the mamma possess an internal secretion, is it a continuous secretion or synchronical with lactation?

The influence of ovary and placenta upon the mammary gland are known. Hyperemia, hypertrophy during menstruation, the large hyperplasia of the mamma during pregnancy, are due to hormonal action from the ovary, placenta and to some degree the fetus. Hyperemia and enlargement of the mamma I found as a constant sequence to injection of corpus luteum extract. Ashner shows microscopic pictures of mammae of virgin guinea pigs following injection of placenta emulsion, which do not differ from the pregnant mamma. After extirpation of the ovaries in the new born guinea pig, no mammary tissue is developed. An interesting fact is that, while the placenta is responsible for the growth of the mamma during pregnancy, milk secretion does not set in until the placenta has been expelled. The influence of ovary and placenta upon the mamma is thus established; how about the reverse? Extirpation of both nonlactating mammae has no influence upon the other genital organs in the human subject, ovulation, menstruation, gestation occur normally. In animals Scherback found the symptom complex of heat diminished after extirpation of the mamma. Schiffman injected mammary extract in guinea pigs and found the ovaries and uterus much smaller than in control animals. Reduction of fibroids after injection of Mammin—a mammary extract—has been repeatedly reported. L. Adler injected rabbits shortly after the beginning of pregnancy with mammary extract of pregnant rabbits and noticed interruption of the pregnancy in nearly all animals. He also found in the injected animals very marked hyperplasia of the medullary portion of the adrenal glands and holds this responsible for the abortion. The question arises, whether the results of Adler's and Schiffman's

experiments are caused by specific action of the mammary extract or whether they are just reactions of nonspecific proteins. Polano could improve severe cases of dysmenorrhea by producing hyperemia of the mammae by Bier's method. He concludes from this the existence of an internal secretion of the mamma influencing ovary and uterus. Federoff speaks of a direct antagonism of ovary, endometrium and mamma. The experience of dairymen, that castration of the cow produces increased milk production, should be mentioned here. On the other hand, it is well known that milk secretion during menstruation is usually decreased and that a sudden diminution of milk and poor quality of same is often the first sign to the nursing mother that she is pregnant again.

Thus we have seen the ovary incites the development of the mamma in the embryo and adolescent, and stimulates, assisted by the placenta, its growth during pregnancy. Ovarial action decreases the milk production during menstruation and suppresses it during pregnancy. Schroeder noticed not infrequently after castration in women, never pregnant before, colostrum formation. Lactation, activity of the mamma, produces a physiologic amenorrhea and relative sterility, it reduces or inhibits ovarian function. Experimentally mammary extract of lactating animals produced atrophy of ovary and uterus. We seem to be justified in presuming that the lactating mamma has an internal secretion, that these hormones act directly upon the ovary, producing a normal temporary atrophy of the ovary and by the way of the ovary, atrophy of the uterus. This temporary dysfunction or deficiency of the ovary is Nature's protection of the offspring and the propagation of the race; it insures nourishment for the nursling when most needed and prevents renewed pregnancy. With normal limits this atrophy is physiologic, hyperproduction of these hormones by the mamma will be followed by a degree of atrophy of the ovary closely simulating that of the approaching climacteric in its histologic picture as well as in its symptomatology. I operated upon a woman thirty-one years old, third para, for an acute appendicitis. The woman, who had nursed her third baby eleven months had all the symptoms of lactation atrophy, and was for this illness under my care the last two weeks. At the operation the uterus had the appearance of an infantile uterus, the ovaries looked atrophic. In the right ovary I found a cyst of the size of a hazelnut. I removed it by a wedge shaped excision, taking some of the normal looking ovarian tissue along. Sections through this tissue showed pictures similar to the ones in the early climacteric, no maturing follicles or in the state of degeneration, only atretic and primordial follicles. If the lactating mamma does not produce the normal amount of these hormones, the nursing mother menstruates normally or nearly so, the hyperproduction of these hormones results in dysfunction and tem-

porary atrophy of the ovaries and uterus. If the production of these hormones continues over an abnormally long period through prolonged lactation, a permanent atrophy of the ovary might result. These are the cases Frommel mentions, which give a bad prognosis. I have among my patients two women, one a secondary para, thirty-two years old, who never menstruated after her second baby, which she nursed nine months; another woman, a primipara of thirty-five, who never menstruated after nursing her baby eight months. Both women began to show symptoms of lactation atrophy about the fourth month after their delivery. Both women had normal deliveries, had big babies and had an abundance of milk. Around the seventh month the symptoms of lactation atrophy were very pronounced, the uterus small, the general symptoms very marked. Advice to wean the babies was not followed. Symptoms of the climacteric became more marked and continued for several years with complete amenorrhea. Either the lactation atrophy of their ovaries was so far advanced as to be permanent or we could suppose that their mammary glands still continued to secrete the hormones, retarding ovulation. It would not be impossible to explain in this way the cases of relative sterility long after partus, which some women show.

#### SYMPTOMATOLOGY

The symptoms are manifold, partly produced by the ovarian hypofunction and the consequent disturbance in the interrelation of the other internal glands, partly by the disturbed function of the autonomic and vegetative nervous system. Unlike in the physiologic gradually occurring in climacteric, the other endocrine glands here have no time to accommodate themselves to the hypofunction of the ovary, which fact influences the symptomatology.

One of the main symptoms is amenorrhea, sometimes the only one present. I would state, that the menstruating, nursing mother never shows any atrophy of the uterus. The women, with lactation atrophy, as mentioned before, are often run down, look anemic, under nourished, sallow, have lost in weight, feel very weak, have lost all ambition. A very constant complaint is a dull backache, and a complaint, that while nursing, the baby seems to sap all their strength. The symptoms produced by sympathetic irritation are hot flushes, congestions, hyperidrosis of hand or feet or head, hyperacidity, obstinate constipation, pollakiuria, vasomotor disturbances, such as parasthesias in the hand or feet, tachycardia, precordial oppression, (angina pectoria spuria), dyspnea, hypertension, headache. There are always present psychical symptoms, depressions, or the women are extremely irritable.

The objective symptoms are, the smallness of the uterus, either of the concentric or excentric type, reduction in hemoglobin, hyper-

tension. Some authors observed constantly an increased reaction following adrenalin injection. In short, the symptomatology is very similar to that of the climacteric.

#### PROGNOSIS

The prognosis concerning restitution to normal is good, but has to take the general condition of the patient into consideration. It is claimed that this condition is found mostly in women with a low vitality, poor nervous and vasomotor equilibrium, in older multipara, and weakly individuals, but I will say here, that one of the most persistent cases I observed was in a very strong, healthy looking young woman weighing two hundred and eight pounds and six feet tall. I am under the impression, that I found it not infrequent in women, who previously had an infantile uterus, began to menstruate late, had late conception; in short with hypoplastic genitals.

The treatment consists in weaning the baby, rest for the woman, good wholesome diet with an abundance of raw fruit and milk. The use of ovarian preparations like whole ovary or corpus luteum is indicated.

Prophylactically we should advise the woman not to nurse longer than eight months, to nurse regularly every four hours, not to nurse at night, to get two hours rest during the day, a diet rich in proteins, fat and raw fruit and vegetables and cereals. If the nursing seems hard on the mother, supplemental feeding should be started early.

#### CONCLUSIONS

1. Lactation atrophy of the uterus is the result of hormones produced by the lactating mamma.
2. These hormones inhibit ovarian function.
3. Hyperproduction of these hormones results in atrophy of the ovaries and secondary atrophy of the uterus.
4. If the lactating mamma fails to produce these hormones or produces them in small amounts only, the nursing mother menstruates normally or nearly so. These mothers never present symptoms of lactation atrophy of the uterus.

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## WHAT I HAVE LEARNED FROM MY ONE HUNDRED AND SIX CESAREANS

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JUST as the motor car has revolutionized locomotion, so has the uterine suture of Säger influenced cesarean section. Once the dernier resort of midwifery, with a mortality of one hundred per cent, modern hysterotomy for dystocia is as great a contribution to obstetric art as podalic version or the forceps. A product of twentieth century surgery, its results vary with the personal equation of the operator and the inconstant conditions of each patient. It is only two score years ago that Dr. Robert T. Harris, a foremost obstetrician of that time, wrote, "looking into the past records of New York City and of the United States at large, of ten hospital cesareans in our country, Dr. Lusk's case is the first to recover up to 1887; he is the first to save both mother and child in all the history of New York, the only one of seven operators to meet with success under the Säger method in the United States."

In the same paper (*American Journal of Obstetrics*, Oct., 1887), he adds this historical note: "The July number reports nine cases of cesarean rip by cattle, saving five women and four children. Of the four children one was six months and was fatally injured, three were killed by contusion of the chest, four were extruded dead, five died in eight hours. The tenth case was reported by Dr. Powell of an Indian squaw, in a buffalo hunt in 1852, who made a perfect recovery under Indian treatment. This was by applying plastic clay made into a stiff mud with water. The wound was held together, the clay placed over it, then over this was put a layer of wood fibers. These layers were repeated until a cake, two inches thick, covered the abdomen from flank to flank. The woman was kept on her back during the treatment." This sounds like one of the stories Paré tells of war surgery in his time, when arteries were closed by the actual cautery.

The necessity of doing cesarean sections in the tenement or family home has passed with the multitude of public and private hospitals. Better help, professional environment, a wealth of surgical material and preparedness for emergencies, all help to lighten the burden of responsibility in the hospital. For many years to come the family doctor will continue to be the usual accoucheur, and he is mustering up the courage to be a cesareanist, an office which he has hitherto



yielded to the expert. There is a hue and cry abroad that cesareans are being done too often by unskilled men, for insufficient indications, and therefore with bad results. It may be so, but I allow the same courtesies of judgment to others that I claim for myself, believing as I do that most doctors do the best they can in the stress of emergency.

The modern classical cesarean has three ideals: prevention of peritonitis, a clean, well united uterus, and safety in other pregnancies. To obtain this ideal are proposed special surgical technic, intra- or extraperitoneal approach, the supravaginal uterine incision, and absorbable or nonabsorbable sutures. These questions are answered by men of various minds, as they are influenced by the study of results, but it is evident that as yet no one man knows it all.

The indications for choosing this method of delivery are thus far chaotic. The former absolute indication of contracted pelvis is now extended to include almost any freak of pregnancy or parturition. Cesarean sections are done for eclampsia, placenta previa or abruptio, to prevent the suffering of labor, impacted breech, for illegitimacy, to conceal pregnancy; *Nomen est legio*. It is inevitable that any comparatively new operation should pass through these crude stages, but at length will be established the classic ideal; indication, site of incision, technic, suture, and postoperative management. The earlier dictum, "once a section, always a section," is ignored by some obstetricians, who "run their luck" against the chances of uterine rupture by a later vaginal delivery. Statistics of today show that only four per cent of cesareanized women rupture the uterus in subsequent vaginal labors, and women have been delivered normally without the midwife or doctor knowing they had been previously sectioned. But a recent experience of the writer with ruptured uterus at term has taught him that the danger is a real one and not to be slighted.

Should a primipara be sectioned as freely as a multipara, and how much do previous vaginal examinations contraindicate section? There can be no hard and fast answer to either question; the conservative will hesitate, the radical says, "Save the living child at all hazards."

A word as to the operative technic. The classic abdominal cesarean section is usually easy in the primipara and grows more difficult in later sections, ordinarily from adhesions due to the earlier operation. It need not be restricted to the surgeon proper, but in an emergency any general practitioner with a modern surgical training can do it. It is always a major operation, either the simplest in character or complicated enough to try the skill of the expert. Unquestionably success depends largely upon experience and good assistants. As to the details of the operation, it seems to matter little in the result

whether the abdominal incision is made above, lateral or below the umbilicus, whether the uterine suture is absorbable or nonabsorbable, whether the uterine incision is extra- or intraperitoneal. Many good operators will disagree with these statements, but, in ordinary cases, personal experience and case-reports seem to confirm them. Two-thirds of the author's cases were hospital patients, most of whom were certainly infected by repeated vaginal examinations and forceps trials, and yet there was no mortality from this cause alone.

The number of personal cases, upon which this paper is founded, is too small for the author to assume to prescribe for others the indications for section in border-line cases. Anyone able to do a cesarean section at all is generally capable of deciding for himself whether that is the best way to deliver the given woman. In some border-line cases a trial labor is eminently proper. It means evaluation of the fitness of this patient for the strain of labor, of fetal adaptation to the birth canal, the presentation and position, the manual dexterity of the operator, etc. The chief objection to it seems to be the risk of infection from vaginal examination to learn whether the trial is succeeding. For the expert with sterile gloves and anal examination this risk may be taken, but the author prefers an elective operation, at a time convenient to the patient and himself, rather than a compulsory operation under contrary conditions.

It would be a waste of time for the author to describe the technic of a cesarean operation. The classic method is fully given in modern textbooks, which are as good guides as any printed description can be. It seems better for the occasional operator to familiarize himself with that method alone, rather than attempt to follow the more brilliant and difficult mode of someone, to whom cesarean sections are an every day occurrence. Instead of allowing a woman to exhaust herself in futile labor, labor which too often ends in a fatal high forceps extraction or craniotomy, he might better elect the safer and saner cesarean operation.

A word in explanation of the summary of cases herewith appended. All but about a dozen of these have been done within the last ten years and most of them at the Maine General Hospital. The obstetrical service there is strictly emergency and all of these patients had been attended before entrance by physicians. None of the eclampsia patients were in labor, all had had one or more convulsions, and four of these never regained consciousness after the first. The variety of indications for which section was made is large, but urgent enough, in the judgment of the operator and consultants, to warrant the operation. The mortality may appear high for the small number of cases, but only one death, possibly two, was due fairly to the operation. The death from ileus was probably caused by an error in technic,

that from acute septic metritis and ruptured uterus was inevitable under any method of delivery, and their clinical history is peculiar enough to warrant publication.

A tall, well formed, American woman, forty-two years old, a farmer's wife in prosperous circumstances, had an abdominal operation for tubercular peritonitis several years ago. Since then there had been two miscarriages, one at the seventh and one at the eighth month, each fetus being stillborn. Her last menstruation was July 4, 1921, and she was first visited by the author in counsel January 22, 1922. Urinalysis showed no albumin or casts, but 0.25 per cent sugar. Wassermann was negative. In view of the unexplained death of the former children, she was advised to continue pregnancy as long as possible, to get a viable child. After usual treatment sugar disappeared in a week. She continued well up to two weeks before term when she entered a private hospital for careful observation and preparation for a cesarean section. This had been advised because of the family's urgent wish for a living child, which it was feared might be lost in a difficult labor because of her age, or from the same cause that had killed the other two.

March 11, section was done at a private hospital. She was then in excellent health, there was strong fetal heart and active motion, first cephalic position, and no vaginal examination was made. Upon opening the abdomen by the high incision the omentum was found to cover the uterus with many firm adhesions. The uterus was uncontracted and the wall very thick. A strong, active male, weighing six and three-quarter pounds, was extracted by podalic version. Hemorrhage was moderate, and the uterus was closed by three continuous sutures of plain gut. Abdomen closed in usual manner.

After the operation there was more than ordinary pain in the abdomen, requiring frequent hypodermics through the day and night. Early the next day the heart failed, there was great distention of the intestines, cathartics and enemas were ineffectual, though an intravenous hypodermic of pituitrin was followed in ten minutes by a large gas motion. She died twenty-eight hours after operation.

At the autopsy the abdominal wound was found unchanged, there was extreme ileus, and many adhesions at the site of the appendix, which was absent. The uterine sutures were all loose, the incision gaping, the muscle softened and sphacelated, and the interior filled with a pulpy mass of clot. Further examination showed the right fallopian tube highly inflamed and almost gangrenous, which was certainly the source of the metritis.

There had been no symptom of this salpingitis during life. Whether it had any connection with the former tuberculosis and the two miscarriages and whether she would not have died under any method of delivery, are some of the questions which are still unanswered in this most unfortunate case. It was the first and only death in the author's series of thirty-five elective cesarean operations.

No. 104. A tall, healthy, Polish woman, thirty years old, a housewife and vi para, who could not talk English, was admitted at the Maine General Hospital at midnight, Nov. 9, 1922. Her previous clinical history was as follows;

The first child was born naturally in Russia. The second was stillborn in this city by forceps. The third was delivered by craniotomy. The fourth child was delivered by a cesarean, her first, at the hospital, June 29, 1919. The indication was absolute, the internal conjugate measuring less than three inches. Labor had been active for two hours before entrance. Section was simple and easy, with birth of a strong, active male, weighing nine pounds. The puerperium period was stormy; she had bronchopneumonia on the second day with resolution on the tenth. All skin sutures suppurated and the fascia separated at the center of the incision,

but the wound closed satisfactorily under dichloramin-T dressing. Iodide catgut sutures were used.

She was found in active labor March 25, 1921, and taken at once to a private hospital. The second section was difficult owing to dense adhesions of peritoneum to uterus, and the uterine scar from the former operation was quite plain. The abdominal incision was through the left rectus and a strong female, weighing  $7\frac{1}{2}$  pounds was delivered. The abdominal sutures supplicated as before but there was firm union at last. Pneumonia of the right lower lobe followed operation, which finally cleared up, and she went home on the twenty-seventh day.

On the morning of Nov. 5, 1922, she was said to have fallen upon her left side. During the day fetal motion stopped and slight flowing began, with a little abdominal pain. She was at this time two weeks short of term. This condition continued unchanged for two days, when she was sent to the hospital by her physician at midnight, Nov. 9. At that time flowing had stopped, and there was only "grumbling" abdominal pain, but bleeding began again in the early morning and she was packed by the intern. It was difficult to learn the character of the pain, as she could make herself understood with great difficulty.

Section was done at 9 o'clock, Nov. 9. Temperature normal, pulse 140. No fetal sounds or motion. By vaginal examination the cervix was found half dilated, a mass thought to be placenta covered the greater part of the os, but no presenting part of the fetus could be felt. She was flowing freely dark, clotted blood. The diagnosis was placenta previa or abruptio. Manual dilation of the cervix was rejected because of the probability of tearing it during extraction, and section chosen because least dangerous in her bad condition.

There was a wide scar on each side of the umbilicus, and the abdomen was opened through the right rectus. Everything was adherent inside. The abdominal cavity was filled with large and small dark clots, but there was no fresh bleeding. The fetus and placenta were loose in the cavity, lying to the right of the uterus, which was firmly contracted and lay in the lower quadrant. It had ruptured completely from the fundus to the isthmus through the scar of the second cesarean, the edges of the tear being ragged and gaping. Hysterectomy was done at once, but despite active stimulation she died upon the table. The fetus was desquamating, and was a female weighing five pounds.

So far as is known to the author, this is the first case of ruptured uterus after a cesarean in this locality. The absence of severe constitutional symptoms, either at the time of rupture or afterwards, misled the author and consultants in diagnosing the true condition.

#### SUMMARY

Emergency cases, seventy; elective (not in labor), thirty-six.

*Indications.*—Contracted pelvis, 34; second sections, 12; third sections, 3; obstructed ramus from enchondroma, 1; ventrofixation, 2; placenta previa and abruptio, 11; prolapse of cervix, 3; hydatidiform mole, 2; cancer of cervix, 1; missed labor, 3; eclampsia, 14; impacted breech, 3; preeclampsia, 6; cardiac disease, 4; by request, 3; pyelitis, 1.

*Maternal Mortality.*—Ruptured uterus, 2; previous attempts at delivery, 1; impossible delivery of impacted breech, 1; hemorrhage from placenta previa, 1; eclampsia, never regained consciousness after first convulsion, 3; pulmonary embolism, 2; acute sepsis, not known before section, 1; ileus, 1.



## PUERPERAL SEPSIS (BACTEREMIA) CAUSED BY B. INFLUENZAE

BY WILLIAM THALHIMER, M.D., AND BEATRICE M. HOGAN, A.B.\*

IN 1911 one of us<sup>1</sup> reported a case of puerperal infection with cultivation of *B. influenzae* from swab cultures from the uterus. At this time the only case of *B. influenzae* infection of the female genital tract found in the literature was a case of pyo- and hydrosalpinx described by Kiskault.<sup>2</sup> One additional case has been reported since then. Morton and Famulener presented a case before the New York Pathological Society, December 13, 1922, which yielded a pure culture of *B. influenzae* from a pelvic abscess.

We have had the opportunity of studying another case of puerperal infection caused by *B. influenzae*, which, so far as we can determine, makes a total of four published cases of infection of the female genital tract caused by this organism.

Patient, Hospital number 14163, primipara, age thirty-four, admitted in the first stage of labor, 7/5/22, at 5:30 P.M. Labor and delivery were normal, the baby was born at 10:30 P.M. The position was L.O.A., a right lateral episiotomy was performed, and low forceps used. The placenta was delivered ten minutes later by Schultze's method, and the episiotomy repaired with four interrupted catgut sutures. Nitrous oxide-oxygen anesthesia. Patient complained of pain in the gall bladder region during labor.

The patient was carefully observed during gestation and no abnormality occurred except several mild attacks of pain in the right upper abdomen with tenderness over the gall bladder region, the patient having suffered from similar attacks during the previous two years. The gall bladder could not be palpated, and operation was not considered advisable. The heart and lungs were normal.

*Past History:*—Patient had an appendectomy three years ago after an attack of "flu". The history is otherwise unimportant, except that of respiratory infections. The tonsils were removed six years ago. The patient has had a chronic nasal catarrh for years, and during the fall, four years ago, she had several fairly severe attacks of "grippe" accompanied by chills. In the summer two years ago, there was an acute middle ear infection with a discharging ear. Last winter, there were many severe "colds" and several attacks of severe sore throat. The patient has had no "colds" nor sore throats since September, 1921, the beginning of this pregnancy. Pain over the gall bladder region occurred at intervals during this pregnancy.

### *Course after Delivery:*—

7/7/22. Forty-eight hours after delivery the patient had a chill, lasting twenty minutes.

7/8/22. Chill, temperature 103°. Lochia normal.

R.B.C. 4,000,000; Hb. 78%; W.B.C. 10,600; Polys. 73%.

\*From the laboratories of Columbia Hospital, Milwaukee.



*Blood Culture*—negative.

7/10/22. A daily chill the last two days.

7/17/22. An up and down temperature has persisted, and in the last twenty-four hours, four chills, with temperature as high as 105°. Soft apical systolic murmur.

*Blood culture*:—showed fourteen colonies to each c.c. of blood. These were minute (about 1 mm. in diameter), colorless, transparent, and showed about them typical hemoglobinophilia, with a dark red accumulation of hemoglobin for a distance of from one to three mm. from each colony. The colonies were made up of extremely small, slender, pleomorphic Gram negative, non-motile bacteria, which could be cultivated only on blood agar (*B. influenzae*).

7/18/22. R.B.C. 3,850,000; Hb. 80%; W.B.C. 8,900; Polys. 87%. Lochia, normal. Episiotomy incision is healed.

7/19/22. *Transfusion*, 500 c.c., Vincent tube method. Today patient complained of pain in her left leg, and in the next few days femoral phlebitis developed.

7/21/22. Chill.

7/22/22. *Transfusion*, same method.

7/23/22. Chill.

7/24/22. *Blood culture*:—10 colonies of *B. influenzae* to each c.c. of blood.

7/26/22. Several chills.

7/30/22. A profuse, purulent, offensive vaginal discharge today, which was not present before.

7/31/22. *Vaginal culture*:—a few colonies of *B. influenzae* and a few colonies of staph. aureus. Vaginal smear:—many pus cells, great numbers of large and small Gram negative bacilli, a few extra-cellular Gram negative cocci.

8/5/22. Bimanual Examination. The left broad ligament reveals a large, board like induration, the left adnexa are fixed, and the left fornix is practically obliterated. The right adnexa feel normal and are freely movable. *Culture from Cervical Canal*:—many colonies of *B. influenzae* and a few strep. viridans.

8/9/22. A chill. *Blood culture*:—negative.

8/12/22. Chill yesterday. *Blood culture*:—five colonies of *B. influenzae* to each c.c. of blood. *Transfusion*, 500 c.c. Same method.

8/13/22. Slight chill.

8/30/22. Several chills have occurred during the last 17 days.

9/5/22. Temperature reached normal and remained normal during remainder of stay in the Hospital.

9/16/22. Patient discharged. Bimanual examination (final note); uterus is fairly movable, and except for a first degree backward displacement, is perfectly normal. The induration in the left broad ligament is somewhat less, and that in the left fornix is almost gone. No mass is found.

2/15/23. Patient has remained free from symptoms.

*Discussion*.—Several points seem of importance in these four cases. There is a marked similarity of the two cases of pelvic abscess, and of the two cases of puerperal infection. The thing which seems most striking is the apparently slight virulence of the strains of *B. influenzae* in all four cases.

The source of infection is unknown in each case, and none presented

a recent history of respiratory infection of any kind. Kiskault's case, however, had an attack of "influenza" eight or nine years previous; Morton's and Famulener's case, three years previous, during the influenza epidemic, had an illness characterized by chills, fever and cough which kept her in bed a week; Thalhimer's case had a severe attack of influenza 15 years previous; and our case, four years ago, had several attacks of moderately severe "grippe."

As has already been pointed out<sup>1</sup> the relationship between the pelvic infection with *B. influenzae* and the attacks of influenza which occurred a number of years before is not clear, and the explanation of an etiological relationship is not justifiable. Nevertheless, this sequence in all four cases should be borne in mind.

The two cases of pelvic inflammation had well localized purulent pelvic foci, with symptoms of some duration before operation was necessary. The infection was therefore subacute in nature and each case recovered promptly after drainage of the pelvic abscess.

The two cases of puerperal infection had a rise of temperature and chills on the second and third day after delivery. The chills lasted for only three days in the case previously reported,<sup>1</sup> but persisted for fifty-five days in the recent case, though there were intervals without chills, one as long as nine days. A blood culture taken of the first case four days after delivery during the period of chills, was negative and as no further chills occurred, and the temperature gradually subsided, no more blood cultures were taken.

In the second case a blood culture taken on the second day of the period of chills was also negative, but on the tenth day a blood culture showed fourteen colonies of *B. influenzae* to the c.c. of blood, on the seventeenth day, ten colonies and on the thirty-sixth day there were five colonies to the c.c. Both cases developed a pelvic exudate which gradually absorbed spontaneously. The recent case developed a left femoral phlebitis, and also a transitory heart murmur, which for a time it was feared indicated a bacterial endocarditis, but this murmur was only temporary.

Three whole blood transfusions were performed by Doctor J. L. Yates, by the Vincent, paraffin tube method. Transfusions have been reported as of service in overcoming puerperal bacteriemia. The transfusions were not followed by a chill, which they are more prone to cause in cases of bacteriemia than in other cases, and a considerable drop in temperature followed, lasting for forty-eight hours after the first transfusion, for twelve hours after the second and for twenty-four hours after the third. After each interval chills recurred, and finally ceased eighteen days after the last transfusion, the temperature reaching normal five days later. The impression was gained by everybody in attendance that the transfusions aided the patient in her recovery.

It is an extremely interesting observation that though both vaginal and cervical smears showed great numbers of various types of bacilli and cocci, both Gram positive and Gram negative, only a few colonies of staphylococcus aureus and streptococcus viridans developed in the cultures, although many colonies of *B. influenzae* grew.

The recovery of this case, which had a positive *B. influenzae* blood culture, indicates the mild degree of virulence of the infecting strain of this organism, suggesting that it does not belong to the type of influenza bacillus which Cohen<sup>3</sup> found so fatal in cases of bacteriemia accompanied by meningitis in children.

This case must undoubtedly have been one of puerperal infection (source unknown) caused by *B. influenzae*, with the development during its course of an infected pelvic thrombophlebitis, accompanied by a bacteriemia, and then later by a femoral thrombophlebitis and a pelvic exudate. The bacteriemia disappeared when the thrombosed veins, which were feeding the organisms into the circulation, spontaneously freed themselves of *B. influenzae*.

We are indebted to Doctor R. W. Roethke for the privilege of studying this case.

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## STRICTURE OF THE ESOPHAGUS OCCURRING DURING PREGNANCY

By PORTER P. VINSON, M.D., ROCHESTER, MINNESOTA

*From the Division of Medicine, Mayo Clinic.*

TWO years ago I reported six cases of stricture of the esophagus that had occurred during pregnancy, usually as a result of pernicious vomiting. I have since observed three cases which are herewith reported:

#### REPORT OF CASES

Case 1 (A349024). Mrs. A. R. K., aged forty years, who was examined at the Mayo Clinic, February 2, 1921, had had five pregnancies, four of which were normal. A fifth pregnancy had begun in April, 1919, and had been accompanied by heartburn, but no other symptom was noted until in November when persistent vomiting began. There was no dysphagia, but all food was vomited within an hour after ingestion, and from lack of nourishment the patient had lost considerable weight and strength. December 26 a large amount of brown fluid was vomited, and accompanying this there was marked burning, and substernal pain. No blood or pus was identified in the vomitus. Labor was induced December 28, and a healthy baby was born. During the week following delivery the patient did not vomit,

but expectorated much thick mucus secretion. A week later it was noted that fluids seemed to lodge in the lower portion of the esophagus. This symptom was partially relieved for a few days by the administration of belladonna, but soon became progressively worse and on April 10, 1920, it was necessary to perform a gastrostomy. During the period of vomiting and restricted diet, the patient had lost sixty pounds in weight. For a few days after the gastrostomy, fluids passed through the stricture into the stomach, but complete closure then occurred, although the patient was able to regurgitate into the mouth small amounts of fluid taken through the gastrostomy tube. At the time of examination a stricture, 32.5 cm. from the incisor teeth, was located and gradually dilated to 44° F. with complete relief from dysphagia. The gastrostomy wound was allowed to close, and the patient has continued to carry on the dilatations at home.

Case 2 (A362570). Mrs. E. H., aged thirty-five years, had been married for two years and had become pregnant in May, 1920. She had felt perfectly well until about the first of February, 1921, when lassitude and generalized edema developed. These symptoms became progressively worse, and at the end of a week incessant vomiting began. A normal baby was delivered instrumentally February 17, but the vomiting continued for three weeks. There was very definite evidence of renal insufficiency. On the ninth day after delivery the patient vomited a large amount of blood after which, for a month, her fever rose to 102°; she was semiconscious for two or three weeks. A month after the baby was born, it was noticed that there was obstruction to the passage of food in the lower esophagus, and at the time of examination at the Clinic, June 23, 1921, fluids only could be taken. There had been a weight loss of 25 pounds. A stricture was found, 28.75 cm. from the incisor teeth, and was dilated with graduated sounds to 43° F. with relief from dysphagia. Further dilatations were carried on at home by the patient's husband.

Case 3 (A406774). Mrs. R. C. D., aged twenty-six years, had had two pregnancies, the first of which was uneventful. There had been considerable vomiting during the last pregnancy, and she had lost 20 pounds in weight. During the last two months of gestation there had been considerable distress beneath the xiphoid during meals, or immediately afterward, which was relieved by vomiting. The symptoms had increased gradually in severity. The patient was examined October 5, 1922, six months after the birth of the baby, and a short stricture was located just above the cardia. This was easily dilated on October 6 to 45° F. with relief from all symptoms. The following day the patient went out of town to visit friends and, on her return in the evening, she complained that her heart had been beating rapidly. The next morning marked weakness was noted, and on the evening of October 8 she died very suddenly. A dark colored stool was passed, and mild, mid-epigastric pain was noted just before death. A postmortem examination could not be obtained, but esophageal hemorrhage seems to have been the most probable cause of death.

#### COMMENT

In 1878 Zenker and von Ziemsen reported nine cases of antemortem rupture of the esophagus and attributed this disaster to esophagomalacia involving the lower half of the organ. They believed that the condition was caused by "(1) the presence of stomach-contents, rich in pepsin and acid, (2) regurgitation, (3) protracted retention of regurgitated food in the esophagus, (4) insufficient warmth of the body, and (5) cessation or great weakness of the circulation of blood supply in the esophagus."

In 1919, and again in 1921 Pringle and his associates emphasized the frequency of antemortem digestion of the esophagus, and asserted that the principal symptom of this condition is the vomiting of black or brown material. In some cases red blood was vomited. Substernal or epigastric pain was also often noted by them. They examined the esophagus in sixteen fatal cases and in all, the process was limited to the lower portion of the tube. Healing processes were observed in some of the organs examined.

The vomiting of blood or dark colored material was a prominent symptom in five of the nine cases observed in the Clinic, and in another, it is probable that a periesophageal abscess ruptured into the esophagus. Six of the patients had substernal or epigastric pain. All of the lesions were located in the lower half of the esophagus. It seems reasonable to assume that the strictures reported here represent the healed stage of a digestive process which occurred in the esophagus during life.

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## A CASE OF SEXUAL PRECOCITY

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A. A. HERSHMAN, M.D., NEW HAVEN, CONN.

THE following case report is submitted for publication in order to place upon record the facts and data concerning an unusual case of sexual precocity. While it is true that these cases strictly belong to the field of pediatrics, yet they are of interest to the gynecologist because, as a rule, it is he who is first consulted by the parents of these children. This is due to the fact that, at least in those cases which are due to hypersecretion of the ovary, the condition is regarded as simply one of menstrual disturbance. Investigations, however, have taught us that this symptom is but a minor part of a complex in which probably all the glands of internal secretion play important parts.

In making a differential diagnosis of these cases we must distinguish between those which are due chiefly to pineal involvement, those of adrenal involvement and those due to oversecretion of the ovary. The case here described is a striking picture of this latter condition, the chief characteristics of which are noted to be, enlargement of internal and external genitalia, menstruation, enlargement of the breasts, and the presence of pubic hair.

The patient, J. B., a Russian Jewess, is at present three years and eleven months old, born July 22, 1919. The father is alive and well. The mother died of influenza in 1920. Both the mother and maternal grandmother had a normal menstrual history. She has one brother six years of age who appears normal in all respects. Both of these children were born normally without instruments. The patient has never been seriously ill. Tonsillectomy was performed one year ago in July. Dentition occurred at seven months and she began to walk at 11 months. When she was about a year old the father noticed that the breasts were larger than normal. In February, 1923, she went through a period of normal menstruation which lasted four days and was accompanied by a good amount of flow. She was seen at this and subsequent times by Dr. A. A. Hershman. Six weeks later a similar menstruation occurred which lasted three days. After an interval of three weeks this was repeated. Then followed a period of amenorrhea lasting 8 weeks when another 3 day flow was experienced. This has been the last period of the present time.

The physical examination shows a well nourished, plump child in good health. The physical appearance is striking as shown by the accompanying picture. The immediate impression is that of a well developed, mature woman of child stature. The height is 42 in. (norm. for five and a half yrs.), weight 50 lbs. (norm. for about seven and a half yrs.) The physical examination of the head, neck, chest, abdomen and extremities reveals nothing abnormal. The breasts are those of a woman. The primary areola is well differentiated, the nipples well developed and protuberant. There is no secretion. There is no axillary hair. The pubic hair is moderately thick and covers the pubes. The external genitalia show the labia to be well developed. No internal examination has been made. In order to rule out any possibility

of intracranial tumor an x-ray examination of the sella turcica was made. The plates show a normal sized cavity in that region. In the recent exhaustive article on this subject by Reuben and Manning (*Arch. Ped.*, xxxix, Dec., 1922-Jan., 1923) special attention was directed to the advanced ossification of the wrist centers in these cases. X-ray examination of the wrists in this case shows beside the centers normally present at this age, the trapezoid which usually appears at six years, the pisiform which usually appears at 6 and a half years, and the styloid process of the ulna which is seldom seen before the eleventh year. The anthropometric and mental status of this case was surveyed by Professor A. Gesell of the Yale Psycho-Clinic

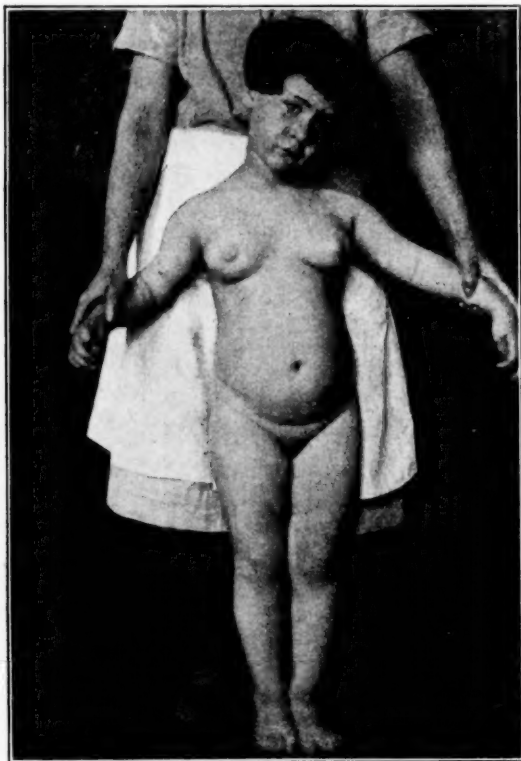


Fig. 1.

His findings besides the height and weight previously mentioned are dynamometer: left grip 8 kg., right grip 10 kg., (norm. for 72 mos.). Cephalic diameters: longitudinal 16 cm., transverse 13.2 cm., brachycephalic index 82.5. Chest girth over breast 60 cm.

Mental diagnosis: Average intelligence. No evidence of psychopathic personality or of mental deficiency. Slightly below normal in motor, language and performance tests. Mental age three and a half years. Voice timbre richer and deeper than average, but no symptoms of marked precocity in personality traits. We are indebted also to Dr. L. H. Wheatley, of New Haven, for the x-ray studies in connection with this case.

# Society Transactions

## THE NEW YORK OBSTETRICAL SOCIETY

MEETING OF MARCH 13, 1923

DR. RALPH H. POMEROY IN THE CHAIR

The meeting was devoted to a discussion of sociologic topics of interest to the specialty of obstetrics and gynecology. The following papers were presented:

1. **The Broader Aspects of Birth Control Propaganda from the Medical Viewpoint**, DR. GEORGE W. KOSMAK. (For original article, see p. 276.)

2. **Prenatal Care as Viewed from the Public Health Standpoint**, DR. RALPH W. LOBENSTINE. (For original article, see p. 286.)

3. **Control of Midwives**, DR. HAROLD BAILEY. (For original article, see p. 293.)

### DISCUSSION

DR. ROBERT L. DICKINSON.—Dr. Kosmak endorsed both in his previous paper of 1915 and in the present paper, the great need of study of this problem. The National Research Council has decided to put \$25,000.00 into study of sex-life. After going over a good deal of the literature, I say we know nothing about the normal sex life of the normal woman, basing such knowledge on good clinical wisdom, and it is time we found out something about it. We do not know what the normal, or, let us say, the average practice of the ordinary husband and wife is. We know next to nothing about the efficacy of contraceptives. We have at last found out a little about the percentage of their use—not through a medical group, but through one of these confounded lay groups that butt into our business and find out something that we need to know.

Now, the Cancer Society and one or two of the other tuberculosis groups have tackled medical problems led by medical men. Suppose the obstetrician and gynecologist do the same. The start has been made for us. The Bureau of Social Hygiene of New York sent out a questionnaire to a thousand intelligent women concerning their sex life. Of these 70 per cent were college and university graduates and many were teachers. All precautions were taken to secure anonymity. The sheets that came back had no names on them. This report of Dr. Katherine Bement Davis finds happiness in marriage reported by 87 per cent. Health after marriage was reported to be as good or better than before marriage in 84 per cent. Those who used contraceptive measures (not abstinence) were 74.11 per cent. The average number of their pregnancies was two and one-half, and one-third of this group were in an age when reasonably they might be expected to have other children. Thus, if this thousand comprises a fair cross section of intelligent American womanhood, the stigma of race suicide can hardly apply, or the fear of the nation dying at the top. The reasons given for the use of these

measures may be roughly grouped as 30 per cent economic and 30 per cent health, and it is noteworthy that the main attack on birth control that it makes for childless marriage, seems to be met by the smallness of the number who took precautions because they wanted no child. These were 3.5 per cent, and this figure includes temporary postponements.

The remainder of the thousand, the group who used no preventives, show 29 per cent sterile marriages and a very large proportion of one-child sterility.

Now, if we got busy ourselves, what would we do? We would first study the problem and find out what there was to it. We know that contraceptives are generally used. The question is, are they harmful? Are they harmless? Do you know? I don't know. Are they efficacious? The social hygiene returns find that with the two most effective measures, the use of the condom and the use of coitus interruptus, the figures (which have not been published) are about 12 per cent failures, but they do not state whether the condom was properly use, tested and lubricated. In other words, no medical details of this study have been made. If the antiseptic douche was effective in 76 per cent, we must not know whether a suppository was used before it and so on. The same need holds good with the cervix cup pessary.

Now, how should we attack the problem? It should be done by some organization which would study the matter. You or I would not go into such a thing unless it was representative, unless some of the leading men of the profession went into it. Under those conditions, would you be willing to start a research? It is up to the obstetricians and gynecologists to decide physical harm or harmlessness. Suppose the money to study the literature, to make the necessary secretarial and other organization is forthcoming. Suppose that men at the head of alienist work, the leading T. B. men, say, "For our patients we need the obstetricians to make such a study and to instruct our patients in contraceptive methods, and to sterilize them when necessary." Would you be willing to join such a committee, to help to organize such a committee? That question was put up to me. Now, the need having been shown, and there being no other organization to undertake it, a small group of men have made a tentative outline of what such a thing should be, and that group is made up of the Director of the Social Hygiene Association, a leading internist, a leading health official, a gynecologist, a prominent nurse, a director of a social agency, (other members are to be added), such work, policies, personnel and procedure to be strictly under medical control. If they are not, we will have nothing to do with it.

Dr. Kosmak cannot see the necessity of an office. Well, there has got to be some kind of a secretarial office: there has got to be some kind of a loose organization to start the experiment. Patients must be sent to some place to be distributed, with a history, with a signed paper that such advice is necessary. Such an office would not examine them, but, simply being a bureau of distribution, would refer them to a clinic where such work should be done. Then the office assembles and studies the results, as such a center alone can.

Does that scheme appeal to you? Is that the way to attack? Is that the way the New York Obstetrical Society should endorse it, or should some Sanger group do it? It has to be one way or the other, I agree with Dr. Kosmak as to the many objectionable ways of the other method or attack on the problem. I do not see any other alternative but for us to guide such a movement to see that it goes slowly, and experimentally, with no publicity, with no general propaganda business, in order to avoid the very things which Dr. Kosmak objects to.

To some of you, to the leaders, I have been asked to send this proposition in order to see whether you approve of it, whether these bigger clinics in New York would be willing to try out some such scheme as this.

DR. G. W. KOSMAK.—As Mr. Dickinson has well said, this is not a problem that can be dismissed by an evening's discussion. It is something that has agitated the world for centuries, and I do not know that we are going to come any nearer to a definite or a satisfactory conclusion, than the Romans did, but they kept at it until Rome fell, and then somebody else took it up and they fell, and I suppose that some day we will fall with our proposition. The laity is taking this thing up in a "serious manner," and we have the two classes of propagandists that I referred to in my paper. I do not like that word propagandist and believe that the proper term for them would be agitators.

We have one group which is sincere in their belief as far as it goes, but, unfortunately, it does not go far enough. I have met with lay groups who thought that if they would only be allowed to get this information from the doctors that that would be all that was necessary. They believe that there is an absolute, safe and harmless method of preventing conception, and I know some of these groups base their faith on one contrivance—some of these women have told me that if they only could have a womb veil it would answer the purpose, and they have told me if we could distribute this thing that is all that would be necessary. Well, any of you who have practiced obstetrics and gynecology know that is not all that is necessary. It takes a lot more than that.

Dr. Dickinson called attention to the necessity for a much closer study of this subject than has heretofore been made, a study which would be based on scientific information, and not merely sympathetic observation. It seems to me that this Society could very well undertake and sponsor the appointment of a committee to really study this subject and come into contact with these outside groups and try to sway them in the right way. I am sure Dr. Dickinson has done a great deal to sway certain people in this direction and undoubtedly there are other members of this Society who could do likewise, and it seems to me, Mr. President, that we might well propose the appointment of a committee of five members, to undertake in an informal way the discussion of this problem, and when the opportunity offers to bring their conclusions before this Society and their possible relations with some of the lay people interested.

Dr. Dickinson's scheme is the first rational one proposed. It leaves the carrying out of this problem in the hands of the medical profession where it really belongs.

If these "propagandists" are given a leeway, and especially if they are backed by certain members of the profession who use their medical title for doubtful purpose, we are going to get into trouble, and I cannot yet countenance the establishment of any center at which cases could be referred to other clinics. Now, every doctor, and for that matter, every hospital can be equipped, or can equip itself with facilities for distributing contraceptive information, and I personally must be more fully convinced of the necessity of establishing a center of this kind.

Dr. Dickinson has referred to certain contraceptive measures. It is very true we do not know whether they are effective or not. Couples come to us after three or four years of married life and wonder why they have no children. We examine them and find many reasons for this. Dr. Rubin's method has shown that a great many of these women are absolutely sterile from tubal obstructions. In many cases, however, the male has not been examined, and, as we all know, the female is not always to blame. Undoubtedly in 50 per cent of cases the males are responsible.

These people get a wrong conception of what this all means, and to prevent themselves from having children they use these contraceptive measures, and later when they are tired of it they wonder why they cannot get children, and it is simply because the wrong diagnosis has been made in the case.



## NEW YORK ACADEMY OF MEDICINE

### SECTION ON OBSTETRICS AND GYNECOLOGY

STATED MEETING, HELD APRIL 24, 1923

DR. WILLIAM E. CALDWELL IN THE CHAIR

DR. CHARLES W. STROBELL read a paper entitled, **Chemical Surgery in Chronic Cervical Endometritis with Rationale, Technic and Case Reports.**

The operation which I am about to describe strikes at the root of practically all chronic pelvic diseases of women, having their origin in cervical infections. The procedure suggested itself to the writer from a study of the work of Curtis, Sturmdorf and Langstroth. These men have shown conclusively that ascending infections do not often involve the pelvic organs by continuity of endometrium and lining of the fallopian tubes, but rather by way of the uterine lymphatics, affecting primarily the parametria and secondarily the adnexa. This conception is absolutely in harmony with our knowledge of the functions and operations, in health and disease, of the lymphatics in general. In dealing with chronic cervical endometritis the problem is to remove the diseased mucosa and at the same time to destroy infection resident in the glandular prolongations in the muscularis, without destruction of these glands; and to preserve intact, through regeneration, the musculature, contour and physiological function of the cervix. Long observation of the behavior of potassium hydroxide on human and animal tissues—the peculiar therapeutic inflammatory reaction in structures adjacent to those acted upon—the striking regeneration to normal of mucous surfaces, the desirability of avoiding cutting, or lacerating procedures, coupled with the fact that the chemical creates its own aseptic field, led the writer to a trial of this agent as a radical cure. Application of this idea has been followed by most satisfactory results. I have now applied this treatment to upwards of 100 cases, and without disappointment. The novelty of the operation consists in the substitution of a chemical substance for the curette, etc., in affecting the radical cure of chronic cervical infections.

The best time to perform the operation is directly after the cessation of menstruation, since this will assure ample time for completion of the healing process before the next period. It is best to have the patient enter the hospital at 2 o'clock in the afternoon, when she is immediately put to bed. The best narcosis is twilight sleep carried to the surgical stage. At 4 o'clock in the afternoon, a hypodermic tablet containing morphine hydrobromide, gr.  $\frac{1}{4}$ ; hyoscine hydrobromide, gr.  $\frac{1}{100}$ ; cactoid, gr.  $\frac{1}{64}$ , is administered hypodermically. At 4:30 o'clock a second tablet of similar strength is administered. If the patient is of the phlegmatic type, the second tablet need not be over half strength. At 5 o'clock the patient is moved to the operating room.

In preparation for the operation, ropes of absorbent cotton,  $\frac{1}{4}$  inch in thickness, saturated with water and wrung out in a towel to near dryness are cut into  $\frac{1}{4}$  inch sections, to be used throughout the operation. These are of value in protecting the vaginal fornices from the action of the chemical, those becoming saturated being quickly replaced with fresh ones. The patient is placed in the

lithotomy position, with a folded bed sheet pad under the sacrum to take the strain from the back. The heels and knees are well supported to secure the utmost relaxation and comfort. The field of operation is prepared in the usual way. Shaving is not necessary. A glass catheter is used to assure an empty bladder. A weighted speculum is placed in position and the anterior and posterior lips of the cervix caught up with curved Skene tenacula. Graduated uterine sounds are then successively introduced into the cervix, until a dilator can be introduced. Should this process disturb the patient novocain solution with adrenalin may be used, though this is seldom necessary. The uterine cavity is now explored and any instrumentation that may be necessary is done. The anterior lip of the cervix is then drawn forward by the tenaculum in the left hand of the operator, the posterior lip being made taut by traction on the tenaculum in the right hand of the assistant, standing to the right of the patient. Two of the cotton sponges are laid close to the cervix, in the posterior fornix, and under the tip of the blade of the speculum, to protect the posterior vaginal wall. The cervix is then moderately drawn downward and the anterior and lateral fornices packed. The cervix is wiped dry and filled with adrenalin-soaked gauze for two minutes. This being removed, the free end of a crayon of C. P. potassic hydroxide, held in the grasp of a long curved hemostat, is rapidly, yet gently introduced into the cervical canal, until it meets the resistance of the contracted internal os. The crayon should be made to sweep the walls of the cervical cavity, with a circular, wiping motion, under moderate pressure. At the expiration of five seconds the crayon should be removed, and the excess liquid caustic and blood mopped away. Water, applied freely, is the most effectual neutralizer and control. The sponges in the fornices are removed and water-soaked sponges applied in rapid succession, washing out the deeper portion of the vaginal sac. The parts are then prepared for a second cauterization, lasting only four seconds. The inclination to keep on cauterizing must be resisted. Should a third application be necessary the caustic should be applied for a period not to exceed two seconds. The diseased tissues must be removed, but only down to the muscularis. If this is done properly, the muscularis not only will not cicatrize but the histologic elements of the mucosa will be regenerated, and the canal lined with normal ciliated columnar epithelium. This operation is simple, safe and aseptic, the loss of blood is negligible, and there is no danger of postoperative hemorrhage.

The dressing consists in lightly packing the fornices and vaginal canal with two thick ropes of plain sterile gauze liberally smeared with sterile vaseline and packed around the cervix, the ends projecting from the vagina. This dressing may be removed by the patient at the end of forty-eight hours. The patient is seldom troubled with nausea or vomiting and after her breakfast the next morning is allowed to return to her home. The after-treatment consists of the administration of three vaginal douches daily, consisting of warm, boiled saline solution,—one teaspoon of common table salt in each gallon of water. After two weeks twice a day will be sufficient, until the end of the fourth week when the douches may be discontinued. During these four weeks the patient is inspected every fourth day to make sure that all is going as it should. Under this treatment leucorrheal discharges cease almost at once, cervical erosions, ulcerations and hypertrophies gradually subside and disappear, and the portio vaginalis resumes its normal form and color. The woman experiences a new lease of life and is "headed" away from the operating table toward which she was drifting.

#### DISCUSSION

DR. FRANCIS W. SOVAK.—I have visited Cuvellier's clinic and have seen cases treated by a method similar to that described by Dr. Strobell. I have seen

them use a sodium hydroxide and lime pencil, which they forced into the cervix and up to the internal os. I brought some sodium hydroxide and lime pencils back with me and tried them on 20 cases at Bellevue Hospital. Three days after the treatment the patients complained of profuse hemorrhage and on the day following the treatment they complained of severe pain. For three days after treatment they complained of pain due to an adnexal condition.

DR. STROBELL, (closing).—I am at a loss to know just why pain and hemorrhage followed in the cases cited by Dr. Sovak, unless it was due to lack of familiarity and experience with the chemicals, coupled with nonconformity to well-known surgical principles. Also I do not advocate the use of fused soda and lime, as I have had no experience with it. Certainly in my own work there has been no instance of either operative or postoperative pain or hemorrhage from the use of caustic potash according to this technic in the approximately one hundred and eleven cases thus far completed.

I think it absolutely essential to dilate the cervix as preliminary to the application of the caustic. Free dilatation affords ready access to both cervical and uterine canals, it facilitates exploration, drainage and control, and obviates postoperative muscular spasm. Cervical dilatation enables me to see each step of the operation and to assure myself that the potassic hydroxide crayon does not penetrate to the internal os nor enter the uterine cavity.

I have definitely worked out the length of time contracts of the chemical and the diseased mucosa, which are five, four and two seconds, respectively and consecutively, to the exact degree of destruction of the diseased tissues.

Those who have received this treatment have not complained of untoward sequellae, and invariably return to their accustomed duties in the home, office, or workshop on either the day following operation, or the next thereafter.

Personally, my experience with this operation is that it is simple, safe and one hundred per cent effective in the treatment of this disease, and if generally employed would lessen the need of intraabdominal mutilations fully 50 per cent.

The formation of scar tissue is not a part of the operation. The technic has been particularly developed to obviate such a misfortune. Muscularis is not to be cauterized, and scar tissue could only result from unskilled application of the method. Dilatation facilitates ample access and control. Familiarity with the "drive" of the chemical is the keynote of success. The operation does not in the least interfere with future childbirth; it restores the uterine canal to normal, and cures sterility due to cervical catarrh. The operation has not interfered with subsequent childbirth.

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DR. EDWIN WILSON HOLLADAY read a paper entitled **Treatment of Pelvic Infections**. (For original article, see p. 299.)

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DR. ISIDOR KROSS read a paper entitled **Pelvic Inflammations, Their Etiology and Pathology**. (For original article, see p. 308.)

#### DISCUSSION OF PAPERS OF DRs. HOLLADAY AND KROSS

DR. JOSEPH BRETTAUER.—While there might be some difference of opinion regarding some of the minor points, there can hardly be any discussion about the main principles laid down by Dr. Holladay.

Personally I have never deviated from the line of ultraconservatism, in the acute stage of pelvic inflammatory disease. There was a short period when, stimulated

by reports from various sources, I interfered earlier with the idea of retaining part of the pelvic organs, and possibly their function. My results were extremely unsatisfactory; pregnancy practically never occurred and secondary operations had to be resorted to frequently.

Today I am more conservative than ever before in finding indications for interference in these cases; many young women are admitted repeatedly to my service in the course of years for conservative treatment and thus escape operation. When I do operate, I am rather inclined to be radical.

DR. WILLIAM E. STUDDIFORD.—One or two points are to be emphasized. First, with reference to puerperal infections, I know from long experience and from the type and amount of material handled that the conservative plan of treatment, as carried out by Dr. Holladay and Dr. Holden, has given most excellent results. One trouble in dealing with puerperal infection in times past was, first, a guilty conscience on the part of the attending physician, and second, the urgent demands on the part of the family who felt that something must be done. The result was that the obstetrician tried to check up as to whether he had done something wrong, and the family were filled with the old idea that something must be done. Under such circumstances the mere giving of fresh air seems to be a poor substitute when the family wants to know when the obstetrician is going to do something. I also know that there is no better place than Bellevue Hospital in which to handle such cases. The wards are suitable and the patients are relieved from expense. A case of puerperal fever needs careful handling and it is expensive to provide adequate care; on the other hand, the lack of adequate care leads frequently to fatal results. I recall one patient who was carried along for a period of five months, with a daily visit by the physician and the daily question whether to operate today or possibly tomorrow. That patient was visited by many physicians and it was always a question whether to operate or to let her alone, and we let her alone. That was five or six years ago and the woman has had two children since. Such results could not be obtained in any other place than Bellevue or under the conditions that obtain there. Of course the amount of material is very great there and I have no criticism with the plan of treatment. I know it will give satisfactory results, if the treatment is prolonged and the patient is carefully watched, and the condition kept under control by caustics or the actual cautery or dyes for cleaning up the cervix, and the general hygiene directed along proper lines. In many of these cases which were operated upon, if treatment had been prolonged, operation might possibly have been avoided.

As to the question of tuberculosis, the reader of the paper suggests a 5 per cent incidence among those treated at Bellevue. I went over a series of 600 tubes and found 6 per cent tuberculous. In many there was no evidence on macroscopic examination, but tuberculosis was found on microscopical examination. As to treatment of pelvic tuberculosis, in cases in which the diagnosis is made on opening the abdomen, in which there are adhesions in the pelvis and intestinal adhesions, and where the tuberculosis is of severe type, it is best that these cases be left without surgical interference. When one finds such a condition, it often requires more courage to close the abdomen than to proceed with operation. On the other hand, in such cases requiring considerable interference, the result is often an intestinal fistula. Unless there has been a long freedom from fever, the absolute indications are for letting these cases alone, or not operating until the fever has subsided.

DR. H. N. VINEBERG.—Are we compelled to wait? Is there no way by which we can avoid recurrences until the time is reached when radical operation has to be done? It is a sad commentary on gynecology that we have these patients in bed weeks and months and yet they are not cured and finally have to come to a radical

operation. With improved methods there should be a way of preventing these cases from becoming so diseased that complete hysterectomy has to be done. When a puerperal exudate exists with fever and there is a subsidence of the fever for a few days or longer and then there is a recurrence of this fever, you may be sure that you have a pus focus and you may go for it as soon as is convenient.

As to hysterectomy, where the adnexa have to be removed, if I understood correctly Dr. Holladay said that only when the cervix is diseased he removes it. I think that the cervix should be removed when there is such extensive disease that hysterectomy has to be performed and the uterus and adnexa have to be removed. In such cases one should take out the cervix because this gives better drainage. I never suture the skin when there is pus in the abdomen, I just bring it together with adhesive strips and leave in a gauze drain, and it is surprising the number of cases that heal up primarily when treated in this way. If one sutures the skin he very frequently gets stitch abscesses.

I am surprised at the figures on tuberculosis of the adnexa. It is my experience that rather rarely the uterus is involved. So far as my experience goes such a radical operation in tuberculosis is unnecessary. I only remove the pyosalpinx if it is on one side; I have done this in cases where the patients have lived fifteen or twenty years without recurrence. The tuberculosis of the tubes is usually unilateral and where one finds a tuberculous pyosalpinx without involvement of the peritoneum I think it is entirely unnecessary to remove the uterus or the adnexa on the opposite side. Of course it is different when there exists a pretty general involvement of the peritoneum. In these cases it is rare that the tubes form distinct pyosalpinges.

DR. ROBERT L. DICKINSON.—I draw attention to the low mortality that Dr. Holladay has reported and I can explain that mortality having seen his service operate. You must remember that the service at Bellevue gets a rotten type of cases and that there are many prostitutes; it is not a simple class of cases to handle, and to get a mortality as low as the men on that service get is very creditable. The reason they get this low mortality is because they do not crowd yards of dry goods into the pelvis to sandpaper the peritoneum to wall off for pus, and they do a minimum hauling and mauling of the tissues. They have learned that much of the pus is sterile. They know just the point in the culdesac where the pus is going to break out, if it does break out, and watch that point. That is the reason their results are as excellent as they are.

With reference to the paper which reviewed the pathology—Were those frequently recurring cases, the ones that have attack after attack, and that keep recurring? Are those attacks reinfections, gonorrheal ascending infections, or are they mixed infections? Are most of these recurrent cases streptococcus infections? Has Mt. Sinai enough cases cultured to make a statement of the difference in the mortality between gonococcus and streptococcus pus tube operations?

DR. A. J. RONGY.—In 1906 I wrote a paper, entitled "The Conservative Method of Treatment of Pelvic Infection," which was published in the International Journal of Surgery. I have had no reason to change my views on the subject since then, and I fully agree with all Dr. Holladay said tonight.

I failed to note whether the mortality statistics included the nonoperative group of patients. Some of these patients are brought to the hospital in a moribund state, beyond surgical or medical help, and it is really unfair to include such patients in our statistics.

I believe that a great number of cases of pelvic infection are due to induced criminal abortions. If we wish to reduce the number of pelvic infections in New York, it behooves those men on hospital staffs not to treat lightly the criminal



abortions, induced by physicians and midwives. Abortions are too often protected by the doctors on hospital staffs. It is probable that 50 per cent of pelvic infections would not occur, if it were not so easy for the average woman to procure the services of a criminal abortionist in this city.

At the same time I feel that the present medical indications for the induction of abortion should be revised, as they did not keep pace with the progress that medicine has made in the past twenty years.

DR. WILLIAM P. HEALY.—When I have been able to recognize a definitely infected ovary, I find it will not clear up without operation. The sooner such a condition is taken care of the better, if the general infection has subsided.

DR. MAURICE O. HAGID.—What has impressed me this evening is that almost everybody spoke of an infected cervix as being the cause of many gynecological troubles and Dr. Vineberg's appeal to the young men to find ways and means so that these cases shall not come to the operating table for hysterectomy. If we studied our cases and took the proper care of the cervixes, we would avoid many hysterectomies. Pathologists have shown us that the diseased cervix is fundamentally the cause of many conditions other than those present in the cervix itself. I was sorry to hear Dr. Strobell refer to Dr. Sturmdorf's tracheloplastic operation as an amputation of the cervix. This operation is not an amputation. I have followed it for ten years and have seen many patients delivered who have had this operation performed. I cannot see, when we have this surgical procedure, without any danger, why we should seek other methods and other operations for the cure of chronic endocervicitis. Dr. Holladay spoke of a modified Sturmdorf. I should like to know what kind of a modification he referred to, for, after all, the fundamental principle of this tracheloplastic operation is to enucleate the infected mucosa without disturbing the muscular mechanism of the cervix and to reline the raw cervical canal with healthy vaginal mucosa, thus giving the woman a chance to bear healthy children without impairing the function of the cervix. Dr. Strobell has not told us whether the use of caustic in his procedure results in functional impairment of the cervix or not. He states that he has used the procedure one hundred times but has not told us whether these women have since borne children. Dr. Strobell emphasized that he removes the focus of infection. So do we, but in a much shorter time and without danger of forming scar tissue in the cervical canal, which may interfere at the time of childbirth.

DR. HOLLADAY, (closing).—In reply to Dr. Brettauer's remark that he was surprised at the relative number that came to operation and as to how conservative we were in that number, I might say that a fairly good percentage of the cases operated upon had a fibroid condition complicating the salpingitis or other pelvic infection. The fibroids were present but the infection giving symptoms was what brought them to the hospital and they were operated on when in condition. On the other hand, I think that possibly he may not have been able to keep his patients in bed long enough for the infection to subside sufficiently. They may have been allowed or went home too quickly so that there is danger that when they return and have to have an operation something more radical has to be done because the disease has progressed so far. We have tried to be conservative and have had patients go out and return three or four times before they received operation.

In the badly matted up tuberculous cases to which Dr. Studdiford has referred we would remove nothing either if it looks as if the intestine might be injured with danger of a fistula resulting. This is a condition that is not to be borne lightly and we seek to avoid its occurrence.

Dr. Vineberg remarked that if he does a hysterectomy he makes it a complete one.

On our service there are a number of different operators and we do not make a practice of doing the complete operation in the hysterectomy cases on account of the slight increase in the risk. In some cases we clean up the cervix with cautery beforehand so that we do not have a diseased cervix when we come to the operation. In other cases we remove the cervix below at operation and decide when we get in above whether hysterectomy is indicated. In this way we do not burn our bridges behind us and have to do the complete operation if the uterus has to be removed. I shall not attempt to put the number of our tuberculous cases against Dr. Vineberg's cases for he has seen many more cases. I have given statistics from the literature and not my own.

With reference to Dr. Rongy's question as to the nonoperative mortality; that was shown in Chart 1. It was 1.6 per cent including both the operative and nonoperative mortality. I did not separate the operative from the nonoperative in estimating the mortality rate. We do not protect the midwives or doctors in abortion cases. Every case of abortion is reported to the Board of Health. To bear witness to this fact if you come to Bellevue you will always find a policeman sitting on the job.

As to the question of what was meant by the modified Sturmdorf operation, I believe that if you are going to call an operation the Sturmdorf operation, it should be done just as he does it, and if not, it should not be called his operation. We put an additional suture on either side to control bleeding. We do not call it a Sturmdorf operation because we do not do it as he does.

DR. KROSS, (closing).—In answer to Dr. Dickinson's question in regard to the cases with repeated attacks, I would say that the infection spreads by the lymphatics and becomes periuterine and peritubal, reaching the peritoneum in this fashion when the tubes are closed; when they are open the infection spreads along the mucosa and, on reaching the fimbriated extremity of the tube, spills over into the peritoneum. In a fairly large series of animals I produced in one-half a general septicemia and in the other half a general peritonitis. I then treated one-half of them conservatively and the other half were given protein injections. I found that the animals that received the protein injections had a much shorter duration of life and a larger number succumbed. In addition there were two cases recently reported in the literature in which the patients had an anaphylactic death. So on the basis of experimental knowledge and of these two cases I think it is wise to proceed carefully with protein injection.

## THE NEW YORK OBSTETRICAL SOCIETY

MEETING OF MAY 8, 1923

DR. RALPH H. POMEROY IN THE CHAIR

**DR. ROBERT L. DICKINSON presented a Brief Review of the 1923 Report on Prostitution by the American Committee of Fourteen.**

The renewed interest in social problems on the part of our Obstetrical Society leads one to present a statement of real progress in a matter in which we often despair of progress.

The Committee of Fourteen was organized in 1905 to secure the suppression of the disorderly resorts known as Raines Law Hotels. To fit the Raines Law a few rooms were added to saloons for the purpose of classing the saloon as a

hotel, then these accommodations were worked to bring in profit by leasing a room more than once in a single evening. The Committee effected the suppression of these hotels and of many disorderly resorts, and this was done largely by securing cooperation with the brewers who financed the saloons and with the Surety companies that bonded them, through an appeal to the big brewers and to the directors not to give aid, by their "hotels," to commercialized prostitution. The Committee has been instrumental in securing amendments of the Tenement House Law, making it more effective against the owner as well as the prostitute and her exploiter. The Committee has also contributed to the suppression of prostitution by close observation of court proceedings, bringing the results to the attention of the judges and thereby enabling them to do more successful work. Combined effort, official and volunteer, against prostitution has produced noticeable results. This report maintains that New York has less open vice than any other of the world's largest cities.

Since the recent changes in licensed traffic in liquor the Committee's staff no longer is occupied with investigations of saloons and hotels. Its intensive study has now been turned toward the proceedings in the Woman's Court. This court has become of no little importance in the efforts to suppress prostitution. The large assignation hotels have been closed by progressive police action. A case in point was the notorious resort on East 14th Street run by the ex-pugilist Tom Sharkey. His conviction and prison sentence closed the place.

The work of the Committee is done in cooperation with the police. The difficulties connected are many. Owing to the disagreeable nature of the work reliable new police officers are not easy to secure. New ones are constantly needed, for officers so employed soon become known to the older law breakers, and hence are unable to secure evidence. New men lack the experience to secure efficient evidence against clever offenders. Again, since the closing of the saloons, always centers of information, evidence is less easy to obtain. The same difficulties affect the members of the staff of the Committee of Fourteen.

The Committee believes that the customer as well as the prostitute should be punishable as a vagrant, but no satisfactory amendment of the law or solution of this problem has yet been drafted.

The general closing of assignation hotels has been mentioned, but some hotels still need careful watching and a few arrests of women in hotels are still made. The furnished room house, the apartment house and the taxi are the problems on which more intensive work is being done. No claim is made that commercialized prostitution has ceased to be a serious social problem. The venereal disease reports are evidence enough. Though less venereal disease than tuberculosis is reported by the Health Department, it is believed that the proportion of the former unreported is many times more than the incidence of the latter.

A stricter supervision of dance halls, theaters and other places of public resorts would aid, but the American public is now in the throes of the greatest paternalistic governmental effort to regulate individual life that has ever been attempted and further attempts at regulation, unless of undisputed need, cannot anticipate favorable consideration. The long sought buildings for a Woman's Court and House of Detention will be a landmark of progress. For these the funds have been appropriated.

The main feature of the 1923 report is a study of recidivism. Prostitutes convicted in New York City have had their finger-prints taken since September, 1910. This sure identification permits reconvictions to be studied. It is the comparison between the numbers of first and repeated sentences that gives point to this study. The report covers 8,152 convictions.

First offenders never reconvicted constitute .....	82.2	per cent
"Casuals" reconvicted once some time within five to eleven years, constitute one in eighteen, or .....	5.5	per cent
Persistent offenders are one in thirty-seven, or .....	2.8	per cent
A study of probation cases show that of first offenders only one in eleven was reconvicted, or .....	.85	per cent

Women convicted and sent from the Woman's Court to the reformatory institutions may be detained for three years. The House of the Good Shepherd, the Inwood House, and the House of Mercy report on 925 individuals placed in their care. Among these, the first offenders who were never reconvicted constitute 80 per cent. Of those not first offenders who were never recommitted we found 70 per cent. The Bedford Reformatory, reporting on 150 cases (members of a group not as promising as those in the other reformatories) show among first offenders 65 per cent never recommitted.

It would seem to be a fair comment on our part that, as far as convictions can prove anything, these results of the work of the courts and the reformatories are far more promising than the literature on this subject would have led us to suppose. The small number of persistent offenders and the large number of those who had been convicted but once stand out in these studies. It will be seen that the figures run very consistently to the effect that four out of five of those convicted for prostitution or sent to reformatories are not again convicted, and that the number of persistent offenders is small—less than 3 per cent. The distressing thing about the figures is the steady supply of new individuals. The hopeful thing is that the police are steadily at work and that a group of thoughtful citizens, persistently studying the problem in a broad-minded way do important service to bring about better conditions. This is one of many striking examples of what a power a group without power may be. With no legal standing, but with a will to serve with quiet collection of facts, with argument from the facts, and intelligent suggestion based on their studies, the darkest of all our social problems gets some start toward solution.

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DR. ALBERT M. JUDD presented a paper entitled, **Urinary Symptoms in Women Due to Urethral Pathology Only.** (For original article see page 318.)

#### DISCUSSION

DR. H. D. FURNISS.—I have seen relatively few of the acute gonorrheas of the urethra in the female, and those in a brief space of time, recovered spontaneously. The most troublesome cases are of the chronic type, which I believe are not of gonorrheal origin. In a few cases where there was a tonsillar infection and the tonsils have been removed, I think they have gotten better. I agree with Hunner that possibly they were expressions of a focal infection somewhere else in the body.

Most of the women we get complaining of urinary symptoms have very little to be seen in the bladder. Most of their trouble is located in the urethra or in the trigone, and in those people I have gotten the best results along the line Dr. Judd has advocated; that is, local treatment, but in stronger solutions of silver than he uses (5-10 per cent) and dilatation with the Kohlman thin-branched steel dilator, with a rubber cover. A dilatation of 35-French is usually sufficient.

A number of these women have very peculiar symptom-complexes; that is, they

complain of a condition which we might call urethral crises once or twice a day or once or twice a week, marked by sudden acute pain in the urethra, which lasts an hour or two and spontaneously disappears. It does not seem to be dependent on anything in the way of diet or exercise or drinking. In two or three patients there were small urethral diverticula, probably the result of perforating urethral abscesses opening in the urethra and leaving a little pocket afterwards. In attempting to dissect them out you may injure the sphincter of the bladder. Recently I had one where we were able to get a rather exact picture of a diverticulum seen through an endoscope, by radiographing the patient with a dental film in the vagina, after filling the urethra with sodium iodide. There was a little pocket in the urethra with a small diverticulum about the size of the end of your finger on the side.

DR. W. P. HEALY.—I had an interesting experience with a case two or three years ago with a very intense trigonitis and irritative inflammation of the upper end of the urethra, just at the vesical sphincter. It was only partially helped by local treatment and was completely cured by colonic irrigations. A year later with a recurrence of her attack she was cured without any local treatment whatsoever, by colonic irrigations, so that really bears out Dr. Hunner's and Dr. Furniss' suggestion that some of these cases of local bladder irritative conditions are secondary to focal infections elsewhere in the body.

DR. W. A. JEWETT.—I would like to ask Dr. Judd if he can give us any idea of the frequency of stricture in the female urethra, and also the most probable location. It may have been because I have been careless in observing the condition, but, personally, my only experience with the difficulty has been at the external os of the urethra.

I would also like to take a little exception to Dr. Judd's statement that the female urethra, particularly its upper end, is the same as the male urethra. We have no ejaculatory ducts or prostate in the female. We have the vesical neck surrounded by the cut-off muscle which comes down as a funnel in the straight urethra, and it seems to me that the conditions are not the same as in the male. In other words one would expect to get, instead of what the genitourinary surgeons speak of as a posterior urethritis, an inflammatory process of the vesical neck, just within the cut-off muscle, or anterior urethra, in those cases.

DR. ALBERT M. JUDD.—I find that the best instrument is the old Valentine endoscope. It is equipped with a globe on the bottom and there is no obstruction so that one is perfectly free to work through the lumen of the tube. The more modern instruments are made with the light taking up part of the lumen of the tube.

I agree with Dr. Jewett perfectly. Of course, we cannot have the same pathology in so far as we do not have the prostatic portion of the urethra in the female, neither do we have the same pathology in the male because we do not have the uterus, tubes and ovaries.

Regarding the question of frequency of stricture, I cannot give you any figures, but it is found very much more frequently than people have any idea of. I see at least two stricture cases in the office every week.

The calibration of the female urethra I do not believe has ever been worked out perfectly.

I do not see why colonic irrigations should not cure urethral conditions in case the primary infection is from that source.

The urethral crises which Dr. Furniss spoke of I feel come a good many times from the fact that Skene's glands become filled up, cause pain, then discharge and the pain is relieved.



DR. PAUL T. HARPER presented a paper entitled **The Utility of Digital Dilatation of the Cervix.** (For original article see page 315.)

#### DISCUSSION

DR. JOHN O. POLAK.—I had supposed until I came here tonight that digital dilatation of the cervix was only of historical interest for it is not practiced much in this city. The longer I practice obstetrics the fewer cases do we find that need to be expedited in that manner. Notwithstanding my appreciation of Dr. Harper's ability, I still doubt that Dr. Harper fails to traumatize the cervix by digital dilatation, even under complete anesthesia.

We have for a long time given up all digital manipulations within the cervix. We find that even bags give trouble, and in the case of these cervices that the doctor speaks of, and particularly the primiparous cervix, as I have seen them, I cannot quite understand how he succeeds in getting his dilatation so effectively by digital methods, even with complete anesthesia. I cannot see in cases of pre-eclamptic toxemia the need for this expediency. Certainly the results in our eclamptic cases are far better when treated expectantly than when we use expeditious methods of delivery, the accepted plan is to treat the toxemias and allow labor to progress normally. This is borne out in an excellent series quoted to us very recently by Williams. In the first 12 years of the service at Johns Hopkins the mortality was 25 per cent with operative intervention, and in the last series of 10 years when they relied on binding and morphine their mortality was reduced to 12 per cent. It is also borne out in the work done in the Lying-In Hospital and in practically all the hospitals here in this city, and while I feel that Dr. Harper has something that he personally can do, I think it is bad teaching to bring back something that we have passed on to history and re-introduce it into obstetrics so that it can be used by those who are not so well trained.

DR. J. MILTON MABBOTT.—I will just cite two deliveries by the method mentioned in one patient, a primipara and a secundipara,—in toxemia incidental to chronic Bright's disease from which the woman had suffered before delivery, and in fact before marriage. We come down to the third delivery, the second patient, a Roman Catholic, the mother of four living children, who had practiced birth control, perhaps by the only proper method, namely, that of abstinence from intercourse, and having in her fourth pregnancy been the victim of a very severe toxemia which had included a partial blindness, was warned against further child-bearing, having been told by an ophthalmologist that a future condition similar to the past probably would result in permanent blindness. Nevertheless when her youngest child was eight years of age, pregnancy again occurred. She declined, on the recurrence of the toxemia of pregnancy with a great amount of albumin, casts, and somewhat scanty secretion of urine, to have any method of interference with the progress of the pregnancy until we were assured she might be delivered of a living child, and, in fact, until her own life and vision were in danger. I permitted her to go on until she was afflicted with a convulsion. She was then in the eighth month of pregnancy. I have gotten a valuable point from Dr. Harper tonight. I did not realize the necessity of full anesthesia before beginning dilatation. But we soon pressed our anesthetic to the full surgical degree and I remember distinctly that although after a rather long interval since the birth of the last child, the cervix did not dilate easily, nevertheless the whole procedure, at the end of a version by which I delivered this child, had occupied from the time I introduced my fingers, followed by the introduction of my hand into the vagina, one hour and forty minutes. The mother made an uneventful recovery, the toxemia disappeared, the kidneys and eyesight returned to normal.

DR. HAROLD BAILEY.—I have had some experience with both the Haris and the Edgar method of manual dilatation twelve or fourteen years ago, and these cases were always dilated under deep ether anesthesia.

Now, as a matter of fact, it seems to me you cannot produce anything resembling full dilatation by either one or the other of those methods, and I think perhaps we misunderstood the speaker. I think perhaps he intimated that he ended the delivery each time by vaginal cesarean section. At any rate, it seems to me that it is absolutely impossible to obtain anything resembling what is normally considered full dilatation of the cervix by these procedures. As a result of my study of these cases that had this procedure applied—the outcome of which was a paper on shock in eclampsia, I was able to show that these cases went through the most severe shock with a very marked drop in blood pressure, in many instances of 100 millimeters of mercury, and we, of course, with every one else changed our tactics about a dozen years ago.

DR. ASA B. DAVIS.—Dr. Bailey has touched upon a point which coincides with my experience; namely, that it is impossible to secure full dilatation of the cervix by digital force. It is possible to carry such dilatation to a point which will admit the fist doubled to its largest size but this does not mean complete dilatation nor does it allow room for the passage of the fetal head or breech. Many of the stillbirths, birth injuries, and lacerations of the cervix are due to forcible delivery by forceps or version through an incompletely dilated cervix.

It has been my fortune to witness the various methods of forcible delivery practiced on a rather large scale in an experience covering a considerable number of years. There was a time when it was considered imperative to deliver the convulsive toxemias with the least possible delay. Fortunately, such cases have largely disappeared and our ideas concerning the treatment of the few cases which we now see have been radically revised, to the great advantage of mother and child.

At one time accouchement forcé was believed to be the best method to follow. Digital dilatation soon became laceration, until it could be carried no further. This was followed by forcible delivery which extended the laceration in too many cases; so that large vessels were torn open, uterine and vaginal packing was relied upon, but was rarely efficient; with the result that a considerable number of these cases died from hemorrhage plus the toxemia, but largely from hemorrhage. This was true of Dührssen incisions, and following the use of the Bossi dilator. With the conception of toxemia and its treatment as understood at that time, delivery by cesarean section was a decided improvement. In very rare instances this method of delivery still has its place in the treatment of eclampsia.

It is conceivable that by the use of light anesthesia for a short time, with repeated digital dilatation, allowing the patient to come out from the influence of the anesthesia and complete the dilatation by her own forces, in carefully watched and well selected cases, this method can be of value.

DR. CHARLES G. CHILD, JR.—I would like to say a word voicing what Dr. Polak has said about the few cases in which it is necessary to expedite labor today under such conditions, and, furthermore, I desire to state my preference for the firm belief that mechanical dilatation by some such instrument as the Higgins dilator is far superior to any form of manual dilatation.

The Higgins dilator has five blades, and was devised some time after the Bossi instrument, to which I feel it is preferable. The five blades come together as compactly as the two blades of the Sim's dilator, which is a distinct advantage when beginning dilatation in a primiparous cervix with a small internal os. When the

dilatation has progressed to about one inch, the instrument is removed, and over the ends of the blades are fitted flanged finger tips that impinge above the internal os, preventing the instrument from slipping out as the dilatation progresses. The blades are separated by the action of a wheel, so that the dilatation can be made slowly, with little danger of tearing the cervix. In this way nature's method of dilating the cervix, i. e., by intermittent pressure, can be closely imitated. With this instrument the cervix during the latter months of pregnancy can frequently be run up to full dilatation in an hour or two without any laceration, and at the end of the dilatation the cervix is thoroughly paralyzed and offers no subsequent obstruction, a great advantage in cases where version is to be performed. In manual dilatation there is greater danger of laceration, paralyzation of the cervix is seldom accomplished, and the fingers are often so paralyzed themselves by the severe and unusual muscular exercise that any intrauterine manipulation with them later is rendered extremely difficult.

DR. RALPH H. POMEROY.—I wonder if there is not a small field for intelligent fingers in the cervix somewhere between the stage of one finger, where you can just touch the skin, to which the doctor refers, and the stage of complete obliteration of the cervix through which we expect to be able to accomplish a forced delivery without added traumatism. Neither condition can be attained by hand dilatation.

The matter is not altogether undebatable, and we must never lose sight of the fact that there is a sane and physiologic justification for the traumatism of the cervix. The cervix is devoted to being traumatized, even in spontaneous labor. It is torn, it is crushed, it is mutilated by the very forces of the uterus itself, and while most of us accept the proposition that cutting is better than tearing, we are not quite sure what the nature of the distention, dilatation, retraction, and disappearance of the cervix is in normal labor. At least, I am quite sure that Dr. Harper knows more what is going on in that resisting cervical rim than any mechanical dilator that has ever been contrived. Perhaps there is a little field and Dr. Harper is ready to defend himself.

DR. PAUL T. HARPER (closing).—In presenting this subject I assure you it was not my intention to advocate anything that even savors of the radical in operative procedures.

Repeated references in the discussion to forcible dilatation and damage to maternal soft parts make it apparent that the proposition as stated has not been understood. This and our Chairman's remarks prompt me to repeat that digital dilatation of the cervix has been offered as a method of *first-stage* treatment, the field for which is admittedly limited. Accouchement forcé as commonly understood was characterized as "in dispute" and discussion relative to it seems far from the point.

In answer to Dr. Bailey's question I may say that all cases upon which digital dilatation is practiced early in labor are certainly not delivered by vaginal cesarean section. No mention of the method of ultimate delivery was made other than reference to the fact that "in suitable cases, met at or near the seventh month, properly conducted digital dilatation can almost invariably be carried to a point where immediate vaginal section can be done."

I cannot subscribe to the proposition, stated I believe by Dr. Polak, that cases of progressing toxemia and eclampsia go into labor spontaneously and progress toward uneventful delivery so often that operative interference is rarely required. The latter is very often demanded if a reasonable margin of safety is to be accorded mother and child.

I agree with Dr. Davis that frequency of toxemia and eclampsia is decreasing and that each, eclampsia in particular, is a highly preventable complication of pregnancy; but the business of prophylaxis, for reasons that are apparent, is as yet by no means 100 per cent efficient and provision for meeting cases of the kind must be made.

In fulminating cases of toxemia and especially in cases of eclampsia, where intelligent eliminative treatment is being carried on and cure or spontaneous labor is not promising, it is imperative that conservative measures that will bring about emptying of the uterus be instituted at once.

Use of the "bag" is a conservative measure but it is far from wholly efficient as a dilator. On occasion it produces little response and less dilatation; but little less often it occasions uterine overaction and progress in dilatation is obstructed. Digital dilatation is offered as a substitute for the bag in cases where the element of time to be consumed in labor is important. With all muscular tone completely removed by deep anesthesia, digital dilatation is as safe and is far more rapid than hydrostatic; and I attempted to show why the intelligent finger is more efficient as a dilator than the purely mechanical elastic bag.

It is in the rare toxic case that is doing poorly, that is not in labor but should be, that digital dilatation, possibly repeated two or three times, promises most. It hastens the business of emptying the uterus when such a procedure is highly desirable, and cervical and lower segment lacerations do not result *when anesthesia is complete* and the procedure is carried out skillfully.

In reply to Dr. Pomeroy's suggestion that a bag would seem preferable to digital dilatation in cases of premature, dry labor, where the readily compressible and easily injured head has been driven well into an incompletely dilated and firm but thin external os, I will say that introduction of a hydrostatic dilator in cases of the kind is difficult and often impossible when dilatation has well advanced. Careful digital dilatation under ether removes undesirable pressure from the head hastens delivery and leaves the cervix intact.

Finally, I repeat that digital dilatation under ether, far from being advocated as a routine procedure, is indicated in a small number of cases where maximum speed in delivery consistent with safety is called for, and it is so employed by us. We respect the integrity of the cervix and lower uterine segment, and records of postpartum examinations made on patients accorded the treatment show no increase in cervical laceration because of it.

# Department of Reviews and Abstracts

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CONDUCTED BY HUGO EHRENFEST, M.D., ASSOCIATE EDITOR

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## Collective Review

### New Books

BY ROBERT T. FRANK, A.M., M.D., F.A.C.S. DENVER, COLO.

**B**Y what method medical publishers select the manuscripts which they publish must ever remain a mystery to the uninitiated. Doubtless appeal to a wide audience and the likelihood of a prolonged demand play no small rôle. From decade to decade the type of book changes and only the fewest treatises or monographs preserve their appeal.

The first book to be considered in this review, is one that deals with every system in the body except that of the female genital tract, and yet I do not hesitate to recommend it most highly to every gynecologist and obstetrician.

It is a sign of the times that a book of this character is selected for translation and that a publisher for it can be found. Even the lay public is coming to know that mere manual dexterity does not make a good surgeon. Pathology is receiving increasing attention and *Pathological Physiology*<sup>1</sup> is constantly growing in importance. Those readers who insist upon direct applicability of their reading to so-called "practical problems" will find that Rost's book fulfills even that criterion. For example the supposed causation of such important lesions as ulcer of the stomach, fat necrosis, gall stones, etc., are thoroughly discussed; the serious results from absorption after intestinal obstruction, blocking of the portal vein, sepsis from peritonitis will be found in its pages. The literature, especially the continental sources, are freely quoted. By judicious interpolations the translator has added the more important American contributions.

The thoughtful reader will be impressed by the fact of the immense number of, as yet undecided, problems and of the importance credited by the author to the nervous system.

This book should prove an exhaustless mine for those seeking new viewpoints, and a stimulus to the surgeon who is interested in functional restoration.

Another book, though neither strictly gynecological nor obstetrical, is, however, of utmost importance to the members of both these specialties.

The incidence of premature birth is great; the mortality of these infants is appalling. Proper prenatal care and facilities for safeguarding the premature infant after birth are necessary.

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<sup>1</sup>*The Pathological Physiology of Surgical Disease. A Basis for Diagnosis and Treatment of Surgical Affections.* By Professor DR. FRANZ ROST, University of Heidelberg. Authorized Translation by Stanley F. Reimann, M.D. With a Foreword by John B. Deaver, M.D., LL.D., Sc.D., F.A.C.S. P. Blakiston's Son & Co., Philadelphia.



Hess<sup>2</sup> divides his monograph on premature and congenitally diseased infants into four main parts, dealing respectively with: (1) the etiology, physiology and pathology; (2) nursing and feeding care; (3) general diseases such as gastrointestinal, respiratory, sepsis, syphilis and diseases peculiar to the premature; and (4) the outlook for the premature.

Prematurity implies birth at least three weeks before term, but weaklings and the congenitally diseased or debilitated are hard to exclude from the discussion.

Part I contains a wealth of well arranged material partly collected from the literature and partly from the author's records. The characteristics of the various organs at different stages of development are particularly valuable.

In Part II every detail is described with minute care. Breast milk is advised in every instance, but if this is unobtainable simple formulae for modifying cow's milk are given. The heated bed is given preference over the closed type of incubator.

In severe instances of stridor thymicus one or two treatments with Roentgen rays are advised. Premature infants with atelectases do not respond well to mechanical stimulation. Of the premature born with signs of active syphilis almost all die. Hess advises that the placenta be examined histologically for signs of syphilis. The reviewer feels that such examination is too uncertain to be of much value unless strikingly positive results are obtained. Even twins may show a positive Wassermann reaction in one and a negative reaction in the other. In nearly 50 per cent of syphilitic infants the Wassermann reaction does not become positive before the third month of extrauterine life. Of diseases peculiar to the premature, rickets, anemia and spasmophilia are described.

In arriving at a prognosis it is well to remember that few infants under 27 weeks survive; also within limits, that a small older child has a better chance of living than a younger one that weighs more. If the newborn cries, stays awake and shows vigorous movements the outlook is good. Famous prematures include Newton, Rousseau, Voltaire, Cuvier, Victor Hugo, Lamartine and Renan.

The book is well illustrated and contains a wealth of interesting topics valuable to the pediatrician and obstetrician.

Schröder's textbook of gynecology<sup>3</sup> is of unusual interest from several points of view. Schröder is one of the most promising of the younger group of gynecologists. He has done exceptionally good work in connection with the study of the menstrual cycle, having demonstrated that the "functional" layer of the endometrium is cast off with each bleeding. In this book we are able to see that his laboratory training has not unfitted him for clinical activity.

The book of 662 pages of large format, contains 324 illustrations, of which those not photomicrographs were drawn by the author's wife. The arrangement, in conformity with modern tendencies, is according

<sup>2</sup>**Premature and Congenitally Diseased Infants.** By JULIUS H. HESS, M.D., Professor and Head of the Division of Pediatrics, University of Illinois College of Medicine; etc., etc. Member of Advisory Board Children's Bureau, Department of Labor, Washington, D. C. Illustrated with 189 Engravings. Philadelphia and New York: Lea & Febiger, 1922.

<sup>3</sup>**Lehrbuch der Gynaekologie.** Für Studierende und Ärzte, von Dr. Med. ROBERT SCHRÖDER, ord. Professor für Geburtshilfe und Gynäkologie und Direktor der Universitäts-Frauenklinik in Kiel. Mit 324 teils farbigen Abbildungen im Text und 3 farbigen Tafeln. Leipzig, 1922, Verlag von F. C. W. Vogel.

to systems, not organs. The anatomy and physiology are most adequately dealt with. Then anomalies of the menstrual cycle are treated in a masterly fashion. The author places ovulation on the 14th to 16th day after onset of the last menses, and considers "*Mittelschmerz*" as an effect of the rupture of the follicle. Like most objectively trained physicians he ascribes little or no efficacy to the ovarian extracts on the market.

The changes of position of the uterus, including prolapse, are somewhat summarily treated. Antelexion is discussed as a malposition. All inflammations of the genitals are considered in Chapter V, and peritonitis is here likewise discussed. The number of proprietary chemical preparations mentioned under the treatment of gonorrhea is quite amazing.

Chapter VI deals with foreign bodies, injuries, cicatrices, hematoma and hematocele. This arrangement separates perineal tears from prolapse of the uterus, in connection with which they logically should be discussed. An excellent chapter on malformation follows. Cysts of the genitals, this signifies retention cysts only, appear quite isolated and disconnected in a separate chapter.

The chapter which deals with all tumors of the genital tract occupies 160 pages. The histology of neoplasms is well presented and illustrated. The prognosis of, and the method of dealing with, ovarian tumors is most inadequately presented. Schröder has heard of only 40 to 50 cases of carcinoma developing in the cervical stump though Polak collected close to 250 from the American literature alone.

This brings up the point that, as far as Schröder is concerned, America still waits to be discovered. I find Cullen's name once casually mentioned, but if any other American author has been quoted I have missed the citation. Occasionally an English or French name crops up.

Operative technic is not discussed. The type of operation, however, is clearly indicated. Conservative measures are described in more detail. The author's therapy is admirably conservative. The book may be regarded as a good example of the views and tendencies of the younger school of German gynecologists who show a return to conservative trends and who are willing to turn to immunology, radiotherapy and "medical" measures as aids or even substitutes for the scalpel.

Slightly disguised, under a Spanish cloak, but yet characteristic, appears a good translation of the 16th edition of Karl Schröder's *Gynecology* edited by Hofmeier of Würzburg.<sup>4</sup> The book is excellently gotten up, well illustrated and brought up to date. The reviewer confesses a distinct fondness for the references in the form of footnotes, as carried out in this edition. The modern way of bunching all the literature at the end of a book, not even according a separate line to each reference, is economical—but nasty.

Another Spanish translation is that of Fabre's (Lyons, France) *Manual of Obstetrics*.<sup>5</sup> This is a small volume of 344 pages based

<sup>4</sup>*Tratado de Ginecología.* Por M. HOFMEIER, Professor de Obstetricia y Ginecología de la Universidad de Würzburg. Con 297 Figuras en el Texto y 10 Láminas. Casa Editorial P. Salvat Barcelona, 1922.

<sup>5</sup>*Manual de Obstetricia.* Por el PROF. FABRE, de la Clínica Obstétrica de la Facultad de Medicina de Lyon, Miembro correspondiente de la Academia de Medicina. Vol. I. Parto Normal, Tercera Edición, Ilustrada con 238 figuras intercaladas en el texto, Barcelona, 1923. Casa Editorial P. Salvat.

upon the third edition. The illustrations are striking, of the poster type, well calculated to impress the student. Although gloves are advised the accoucheur's hand is pictured without these essentials. Undue emphasis and undue space, considering the elementary character of the book, is accorded to the author's method of registering uterine contractions by means of the metreurynter and tambour. Only normal labor and puerperium are discussed.

Of older date (1920) is an entirely Spanish Obstetrics by Girol,<sup>6</sup> an imposing volume of 974 pages. Of especial interest are several gross sections of the pregnant uterus at term and in labor and an exceptionally large collection of fetal monstrosities from the medical museum of the Madrid School. The book shows the influence of the best methods of all countries, but shows little evidence of the development of a Spanish school.

From Ireland we have a "Practice of Midwifery" by Gibbon Fitzgibbon,<sup>7</sup> for three years Master of the Rotunda Hospital in Dublin. This book is disappointing throughout. In his effort to adapt his work to the need of the student, Fitzgibbon has so studiously suppressed his personality and his undoubted knowledge that the text is drab and does not bring out fully the practice current at the Rotunda. We note, without approval, the use of the left lateral posture during delivery and the use of the term "abortion" up to the twelfth week, and of "miscarriage" from the twelfth to twenty-eighth week. The sole point of interest is a cursory report of over 200 cases of eclampsia treated by gastric and colonic lavage, subcutaneous infusion of bicarbonate solution and venesection with a mortality of only 8.87 per cent.

Returning to this side of the Atlantic we take up Plass' "Obstetrics for Nurses."<sup>8</sup> This both consciously and unconsciously shows the influence of the Johns Hopkins School as exemplified by Whitridge Williams. The book is good, but is too theoretical for nurses. With but slight change and some additions it would prove a useful book for the medical student. We are more and more prone to expect the nurse to know too much and to do too little.

Sellheim's Obstetrical and Gynecological Methods of Examination<sup>9</sup> is a useful guide to the advanced student or budding specialist. Much of what is usually picked up haphazard or never learned is here presented in an orderly fashion. The book will also prove of use to the teacher. The clear cut line drawings are excellent.

Liepmann's Course on the Obstetrical Phantom<sup>10</sup> is more specialized than the preceding, dealing exclusively with obstetric diagnosis, maneu-

<sup>6</sup>*Tratado de Obstetricia.* Por el Dr. D. SEBASTIAN RECASENS GIROL, Catedrático por oposición de Obstetricia y Ginecología de la Facultad de Medicina de Madrid; Académico de la Real de Medicina; Presidente de la Academia de Obstetricia y Ginecología de Madrid, Cuarta edición, ilustrada con gran número de grabados, Barcelona 1920, Casa Editorial P. Salvat.

<sup>7</sup>*Practical Midwifery.* By GIBBON FITZGIBBON, M.D., B.Ch., B.A.O. (Dub. Univ.), F.R.C.P.I., L. M. Master Rotunda Hospital, Dublin, with 175 illustrations. London, 1923, J. & A. Churchill.

<sup>8</sup>*Obstetrics for Nurses.* By EVERETT DUDLEY PLASS, M.D. Obstetrician-in-chief, Henry Ford Hospital, Detroit; Formerly Associate Professor of Obstetrics in Johns Hopkins Medical School. New York, 1922, D. Appleton & Company.

<sup>9</sup>*Die Geburtshilflich-Gynaekologische Untersuchung.* Ein Leitfaden für Studierende Ärzte von Dr. HUGO SELLHEIM, o.ö. Professor und Direktor der Universitäts-Frauenklinik in Halle a.s. Mit 94 Abbildungen, Vierte, vermehrte und umgearbeitete Auflage, München, 1923, Verlag von J. F. Bergmann.

<sup>10</sup>*Der Geburtshilfliche Phantomkurs,* in 165 Federzeichnungen für Ärzte und Studierende, von Dr. Med. WILHELM LIEPMANN, a.o. Professor für Frauenheilkunde an der Friedrich Wilhelm-Universität in Berlin. Wien, 1922, Urban & Schwarzenberg.

vres and operative methods. It is profusely illustrated with figures showing a resemblance to those of Farabeuf and Varnier.

The "Causation of Fetal Death," by Eardley Holland<sup>11</sup> is published by the English Ministry of Health. It deals with 300 fetuses of viable age and summarizes an elaborate and painstaking research. Complications of labor, including antepartum hemorrhage and postmaturity account for 51 per cent of deaths, syphilis for 16 per cent, toxemia 10 per cent. Holland suggests that proper antenatal care and better instruction to the medical student will greatly reduce the mortality.

An old friend, but of undiminished value, cropped up in v. Neugebauer's monograph<sup>12</sup> on twin pregnancies in heterotopic sites, published in 1907. One hundred and sixty-nine cases are recorded. Since that date the literature has contained many additional reports. Even these old statistics contain six cases of ovarian and nine of the interstitial site of one of the ova.

The University of Chicago Press in 1917 published a small monograph by Newman on the "Biology of Twins."<sup>13</sup> In clear nontechnical language the human twins, the Armadillo twins (two pair from a single ovum in one species, and twins due to fusion of two ova in another species) and the rare freemartin of cattle are discussed. Now (1923) appears a second monograph by the same author on the "Physiology of Twinning."<sup>14</sup> Twinning, according to Newman, requires totipotency of blastomeres. In certain forms, as for example Tunicates, each part of the egg has a prospective value, hence isolation of blastomeres produces merely parts of an individual instead of two individuals. Newman, in opposition to Stoddard, considers double monsters incompletely divided single embryos. The opposite view is that they are two individuals partly fused. The entire animal scale is reviewed for data. The books are of considerable interest to the medical man.

More specialized but of even more far reaching interest is an account by Bresslau,<sup>15</sup> formerly of Strassburg, of the development of the milk gland which characterizes the large group of mammals. The studies were conducted mainly on the material collected by Prof. Semon while on his trip to Australia, material which had already been worked over by Gegenbaur and Klaatsch. Bresslau believes that the *Anlage* of the breast, as appearing in the embryo of echidna, corresponds to the brooding spot noted in certain birds and philogenetically bridges the gap to those ancestors of the mammal who hatched eggs. In the monotremes no nipples are found; in the marsupials these organs are present. In placentates the breasts, whether a single pair or in multiple,

<sup>11</sup>The Causation of Foetal Death. By EARDLEY HOLLAND, M.D., F.R.C.S., F.R.C.P., Surgeon at the City of London Maternity Hospital, Assistant Obstetrical Physician at the London Hospital. London, 1922, Published under the Authority of his Majesty's Stationery Office.

<sup>12</sup>Zur Lehre Von Der Zwillingschwangerschaft, mit heterotopem Sitz der Früchte, Von Franz Ludwig von Neugebauer Bibliothek medizinischer Monographien, Band I, Leipzig, Verlag von Dr. Werner Klinkhardt.

<sup>13</sup>The Biology of Twins (Mammals). By HORATIO HACKETT NEWMAN. The University of Chicago Press, Chicago, Ill.

<sup>14</sup>The Physiology of Twinning. By HORATIO HACKETT NEWMAN, Professor of Zoology, University of Chicago. The University of Chicago Press, Chicago, Ill.

<sup>15</sup>The Mammary Apparatus of the Mammalia. In the Light of Ontogenesis and Phylogenesis. By ERNEST BRESSLAU, M.D., late Professor of Zoology in the University of Strassburg, with a note by James P. Hill, D.Sc., F.R.S. Jodrell Professor of Zoology, University of London, with 47 Illustrations, London, Methuen & Co. Ltd.



develop along the "milkline," an epidermal ridge extending along the lateral aspect of the trunk analogous to the *Anlage* seen in monotremes and marsupials. There are gaps between all three types, bridged by Huxley's prototheria and metatheria—a fascinating monograph.

The trend toward nonoperative therapeutic measures in gynecology is shown by the little brochure in French on the technic of Thure Brandt. This almost forgotten method is redescribed in glowing terms. The gynecologist will derive profit from its perusal, due allowance being made for the overenthusiasm of its author, Doctoresse Hélène Sosnowska.<sup>16</sup> The gynecologist of today rarely avails himself of this method of massage, most useful in bringing about the absorption of sluggish exudates or to overcome pelvic adhesions.

A further French publication along lines of conservative therapy is the one on Radium in Gynecology by Siredey and Gagey.<sup>17</sup> It is based on 700 cases, but it is to be regretted that the cancer cases have been observed for only two years. Furthermore, today, no such book can pass muster unless Roentgen ray applications to the pelvis are advised to fortify and to complete the treatment by radium.

Teuwirth's<sup>18</sup> short pamphlet praises radium therapy of cancer of the cervix highly. It contains a good résumé of the German literature, but gives no new facts.

In contrast to the foregoing, a French book dealing solely with curettage (indications, technic, accidents and results) is difficult to account for.<sup>19</sup> The reviewer is more and more inclined to relegate the curette to the discard except as a means of diagnosing intrauterine conditions. During the course of exploration, in some instances, curetting at least temporarily relieves bleeding if due to a hyperplastic endometrium. For retained placental tissue, when intervention is necessitated by hemorrhage, the placental forceps should be used. The author, Fiolle, preaches the opposite doctrine and is a fairly active interventionist.

"Obstetrical Tables" by Anderson<sup>20</sup> is a quiz compend of the now happily obsolescent type. The booklet must be of use in "cramming" for examinations, otherwise it would not have reached a second edition.

"The Anatomy of the Female Pelvis" by Maguire<sup>21</sup> fails of being a successful attempt to present this region to the student of gynecology. In connection with the lecture and dissecting room the book may pass, but, adorned by four execrable diagrams, the result is failure, if no anatomical material is available.

Kehrer of Dresden discusses the causes and treatment of sterility

<sup>16</sup>*Thérapeutique Gynécologique, Indications et Technique de la Méthode de Brandt.* Avec 17 figures dans le texte, DR. HÉLÈNE SOSNOWSKA. Paris, 1922, Gaston Doin, Éditeur.

<sup>17</sup>*Le Radium en Gynécologie.* Par A. SIREDEY, & JEAN GAGEY. Paris, 1922, "L'Expansion Scientifique Française."

<sup>18</sup>*Ersatz der Operation des Gebärmutterkrebses durch die Strahlenbehandlung.* Von Medizinalrat DR. NEUWIRTH. Wien und Leipzig, 1923, Wilhelm Braumüller.

<sup>19</sup>*Le Curettage Uterin.* Par J. FIOLLE, Professeur à l'école de Médecine de Marseille, Chirurgien des Hôpitaux. 1922, Masson Et Cie Éditeurs.

<sup>20</sup>*Obstetric Tables. A Guide for Students.* By MAURICE C. ANDERSON, L.R.C.P. Ed., Obstetrician, Brixton Hill Maternity Home, Hon. Gynecologist, Brixton Dispensary, Second Edition, London, W. I. 1923, A. & C. Black, Ltd.

<sup>21</sup>*The Anatomy of the Female Pelvis, Descriptive and Applied.* By F. A. MAGUIRE, Honorary Assistant Gynaecological Surgeon, Royal Prince Alfred Hospital, Sydney: Lecturer and Demonstrator (and Acting-Professor) in Anatomy, University of Sydney. Sydney, 1922, Angus & Robertson Ltd.



in a most interesting fashion.<sup>22</sup> He lays great and probably undue stress upon dyspareunia, especially upon psychical dyspareunia as a cause. In his opinion both myomata and cystic ovaries are due to prolonged disturbances of sex life. Therapy, to a large extent, should be directed toward enlightenment of the couple and along psychoanalytic channels. A wealth of information is contained in this short monograph.

The same subject is treated by the Frenchman Batuaud,<sup>23</sup> from a purely mechanistic angle. It follows that his therapy is directed more toward the cure of cervical lesions and to oöotherapy.

A related subject is discussed by Friedjung<sup>24</sup> in a small brochure. He suggests that the first sex instruction should be given to children of between 4 and 5 years by their parents, and that fuller details ought to be given between the 11th and 13th year. The question is a burning one, especially in Germany, where the percentage of boys infected with venereal disease has risen tremendously since the war (in the year 1919 in Berlin of all patients 28 per cent were boys).

Presumably for grown ups, because it is "For sale only to members of the Medical Profession" is Van Teslaar's "Sex and The Senses."<sup>25</sup> Part I is devoted to dermal stimuli of every variety, including touch, tickle and kiss; their effect symbolically and somatically. Part II deals with autoerotism or masturbation starting with the nursing infant. The view that masturbation *per se* is not necessarily harmful will be shared by every physician of experience. This book will appeal more to professional psychoanalysts than to gynecologists, who, as a class, are usually not readily impressed by "sexological literature."

The preceding two publications form a natural transition to several volumes destined to enlighten the nonmedical public.

Simon's book on "Syphilis"<sup>26</sup> is written in nontechnical language for the laity—"for our children when they reach sixteen years" as he says. The exposition is far too detailed, however, for the average reader in whom it is likely to breed morbid fear or to produce ennui. Physicians will find much of interest in its pages.

Lane-Clayton<sup>27</sup> has written a readable and instructive book on the hygiene of women and children destined for the enlightenment of the nurse and health visitor. Perusal of its pages throws interesting sidelights upon the backwardness of some of the middle sized old British towns in disposal of refuse and sewage. In regard to rural conditions our own conditions are probably on the same plane as those discussed by the author. The book is sane and worth while.

<sup>22</sup>*Ursachen und Behandlung der Unfruchtbarkeit*, nach modernen Gesichtspunkten zugleich ein Beitrag zu den Störungen des Sexuellen Lebens, besonders der Dyspareunie, von Prof. DR. KEHRER, Geheimer Medizinalrat, Direktor der Staatlichen Frauenklinik, Dresden. Mit 4 Tabellen, 13 Kurven und 2 Abbildungen, Dresden und Leipzig, 1922, Verlag von Theodor Steinkopff.

<sup>23</sup>*La Sterilité Feminine, Ses Causes son Traitement*, Avec 23 figures dans le texte, DR. JULES BATUAUD, Paris, 1922, Gaston Doin, Éditeur.

<sup>24</sup>*Die Geschlechtliche Aufklärung im Erziehungswerke*. Ein Wegweiser für Eltern, Erzieher und Ärzte, von Priv.-Dozent DR. JOSEF K. FRIEDJUNG. Wien und Leipzig, 1922, Verlag von Josef Sáfár.

<sup>25</sup>*Sex and the Senses*. By James S. Van Teslaar (For sale only to Members of the Medical Profession) Boston, Richard G. Badger.

<sup>26</sup>*La Syphilis*. Avec 41 figures dans le texte, DR. CLÉMENT SIMON, Médecin de l'Infirmierie spéciale de Saint-Lazare, Paris, 1922, Ernest Flammarion, Éditeur.

<sup>27</sup>*Hygiene of Women and Children*. By JANET E. LANE-CLAYTON, M.D., D.Sc., (Lond.) Dean and Lecturer on Hygiene in the Household and Social Science Department, King's College for Women: Justice of the Peace: Formerly Medical Inspector Under the Local Government Board. London, Henry Frowde and Holder & Stoughton.

Because of a preconceived prejudice at having to review still another book on the feeding, diet and general care of children the one written by Bell<sup>28</sup> proved a most pleasant surprise. It is clearcut, snappy, to the point and most informative. Even the chapters dealing with disease do not arouse the annoyance which attempts to make a diagnostician of the mother usually produce in a physician, because of the tactful way in which this difficult subject is handled. A book worth recommending to mothers.

<sup>28</sup>**Feeding, Diet and the General Care of Children.** A Book for Mothers and Trained Nurses. By ALBERT J. BELL, A.B., M.D., Assistant Professor of Pediatrics in the Medical Department of the University of Cincinnati; Attending Pediatrician to the Cincinnati General Hospital, The Tuberculosis Hospital and the Christ Hospital; Member of the Medical Milk Commission, and Chairman of the Divisional Council on Child Hygiene, Cincinnati, etc. Illustrated, Philadelphia, 1923, F. A. Davis Company, Publishers.

## Selected Abstracts

### Syphilis and Tuberculosis in Pregnant Women

Williams, J. Whitridge: Value of the Wassermann Reaction in Obstetrics. Bulletin of the Johns Hopkins Hospital, 1920, xxxi, 141.

In 4000 women delivered during the period under consideration, 449 or 11.2 per cent presented a positive reaction during pregnancy. Its incidence was much greater in the black than in the white women, being 16.29 per cent and 2.48 per cent respectively. In other words, a positive Wassermann was noted in every sixth colored woman as compared with every fortieth white woman. What is the significance of a positive Wassermann reaction occurring in a pregnant woman? Does it mean that she has syphilis, and will she transmit the disease to the child? To the first question, Williams is not prepared to give a conclusive answer; in answer to the second question, he states that it appears conservative to assume that the evidence at his disposal indicates that less than one half of such women, and possibly even a smaller number, will bear syphilitic children. One baby in 100 (43 out of 4000) will have syphilis even when the maternal Wassermann is negative, and, consequently, one is not justified in claiming that the most ideal prenatal care can entirely eradicate the disease as a cause of fetal death. Turning to the consideration of the significance of the fetal Wassermann at the time of delivery, a positive result was obtained in 38 of the 4000 observations, approximately 1 per cent. This means that only a small fraction of the children born of mothers with a positive Wassermann present such a reaction. Macerated children are not available for the test as their blood is already "laked." Reviewing the follow up records of these children, Williams concludes that a positive Wassermann at birth does not necessarily imply that it will remain so; and conversely, that a negative Wassermann at birth does not necessarily mean that it may not become positive later; and that the information obtained by the Wassermann made from the fetal blood at birth is not commensurate with the time consumed, nor the money expended in such investigations.

Williams is convinced from routine microscopic study of the placenta that the syphilitic lesions occurring in it are extremely characteristic and afford more conclusive evidence of the existence of syphilis than the demonstration of the positive maternal Wassermann, and in general tally fairly closely with the autopsy findings in the child. The present study confirms his previous impressions, for the microscopic examinations of the placentae tallied with the clinical and anatomical findings in the child in from 80 to 90 per cent of the cases,

which was in marked contrast to the 40 per cent obtained from a positive maternal Wassermann reaction.

According to Williams, the possibility of spermatie infection and the admissibility of Colles' law have not yet been conclusively proved or disproved and consequently should be regarded as still *sub judice*. C. O. MALAND.

**Ross and Wright: The Incidence of Congenital Syphilis Among the Newly Born.** Lancet, London, 1921, cc., 321.

The object of this work was to determine the difference in the incidence of congenital syphilis among the newly born in a mining town and in an industrial town. The results were based upon the Wassermann reaction of the placental blood, the specimens being collected by midwives. Each specimen underwent the test in two separate laboratories. In 284 of the 300 blood specimens examined from the mining district the results of the two laboratories were identical, while in 16 cases there was some difference in results or other fault. In ten of the total 300 specimens from the mining district a positive Wassermann reaction was found by both laboratories, or 3.5 per cent.

In the industrial area the number of specimens examined was considerably less, only 40 being obtained. Of these one specimen or 2.5 per cent gave a positive test.

They feel that while the number of blood specimens examined was too small to draw any definite conclusions, yet the number of positive reactions obtained was significant, and calls for further investigation of unselected cases as well as from those where either parent is known to be infected so the reliability of the test may be definitely gauged from the results achieved. Finally they believe that the finding of 3.5 per cent positive results is highly suggestive of the prevalence of apparently undiagnosed syphilis in the general population.

NORMAN F. MILLER.

**Willenbacher, F.: The Wassermann and Sachs-Georgi Reactions During Labor.** Archiv für Gynäkologie, 1923, cxvi, 558.

Study of these two reactions in the blood of 146 patients in labor has confirmed the presence of a non-specific inhibitor of hemolysis giving a falsely positive Wassermann in labor in a small percentage of cases—3 out of 90, known to be free from syphilis; 8 days later, these three were again negative. In 78 cases the Sachs-Georgi test gave no false positives.

Willenbacher gives a thorough discussion of the mechanism of the Wassermann reaction. RAMSAY SPILLMAN.

**Stühmer, A., and Dreyer, K.: The Unreliability of the Serum Reaction for Syphilis in Pregnant and Parturient Women.** Zeitschrift für Geburtshilfe und Gynäkologie, 1921, lxxxiv, 289.

The authors studied the Wassermann reaction in 250 parturient and 37 pregnant women and present the following conclusions:

The serum reactions for syphilis during pregnancy and particularly during parturition are unreliable. In about 10 per cent one has to deal with non-specific inhibitions, sometimes of marked degree.

The retroplacental blood gives the most untrustworthy reactions. Arm vein blood gives better results, but here also a tendency to inhibitions occurs not rarely. Cord blood gives fewer non-specific positive reactions but is not usable since it may give a negative reaction in the presence of definite lues.

The various modifications show varying percentages of error; the precipitation reaction of Sachs-Georgi is the most reliable. The cause of the non-specific reactions may be ascribed to metabolic changes in the liver or placenta. The authors regard the factor of unreliability so great that a serological laboratory in connection with a maternity does not warrant the cost and effort involved.

MARGARET SCHULZE.

**Pomini, F.: The Wassermann Reaction on Retroplacental Blood.** *Annali di Ostetricia e Ginecologia*, 1922, xliv, 688.

In order to control the work of Krukenberg the author has investigated 100 cases from the standpoint of the Wassermann reaction found in the vein of the arm, in the retroplacental blood, and in the fetal blood from the umbilical vein. He finds that there exists in the retroplacental blood a strong tendency toward a positive reaction, which is influenced by strong uterine contractions, but more especially by the constitution of the placental villi. In luetic patients the retroplacental blood is often more strongly positive than that from the arm, while a negative reaction of the retroplacental blood is indicative either of the absence of syphilis or of a probable cure of the condition if such has existed. Deviation of complement is probably due to lipoids expressed from the placenta by uterine contractions; such lipoids probably are present in all retroplacental blood. The results obtained by the author tend to confirm Krukenberg's finding that the blood from the umbilical vein can be influenced in 5 per cent of cases by adding placental extract.

THOS. R. GOETHALS.

**Kilduffe, R. A.: Concerning the Wassermann Test in Its Relation to Pre-Natal and Congenital Syphilis.** *American Journal of the Medical Sciences*, 1922, clxiv, 677.

Kilduffe makes a thorough survey of the literature and places the proper interpretation on the work done. Very properly he puts the work of Williams at the head of the list. The follow-up-system used by Williams proved that a Wassermann positive newborn may become negative without treatment, and that a Wassermann negative may become positive within three years. He also points out the unreliability of the Wassermann test during pregnancy, due to lack of refinement in technic and to errors of interpreting the findings.

Most experimenters have used cord blood but they are at variance as to whether a positive Wassermann is indicative of syphilis in the mother only or in both mother and child. The cord blood was used by Kilduffe for his experiments. While his series comprised only 269 cases, the results obtained were in agreement with those of more extensive investigations and show the unreliability of the cord blood Wassermann in determining the presence of syphilis in the newborn. He states that this investigation should be carried to the extent of including blood from both parents, the child at birth and the child in later life.

WM. KERWIN.

**Esch, P.: Serum Studies in Syphilis of the Newborn from Healthy and Luetic Mothers, and on the Mother in Latent Congenital Syphilis.** *Zentralblatt für Gynäkologie*, 1923, xlvii, 709.

Esch and Wieloch last year reported 195 investigations of blood from the umbilical vein with two strongly positive, two weak positive, and three doubtful Wassermans, where the mother's blood was negative. Five of these seven mothers had reacted positively at one time or other in pregnancy or the puerperium.



The present communication deals with the results of the investigation of infants with manifest syphilis but negative Wassermanns, and the effect of recent or latent maternal syphilis in modifying conditions. Blood was taken from the arm of the mother and from the cord. Thirty cases were investigated, 12 "fresh" cases and 18 latent cases. In the first group, women who had been treated during pregnancy, only 5 showed a positive reaction at the time of birth, and in these the child's Wassermann was positive four times and negative once. Of the four positive children two were premature, and two showed definite syphilitic symptoms. The child with the negative reaction was apparently sound at birth. In the remaining 7 cases both mother and child remained negative, though two of these children were premature but without evidence of lues. Of the 18 with latent syphilis 10 were positive, and of the children 7 were positive and 3 negative. Nine of the children were clinically sound, one with a positive reaction died on the fourteenth day of visceral lues. Of the remaining 8 both mother and child remained negative, but two of the negative children were premature and one showed pemphigus syphiliticus. The author suggests that blood from the umbilical vein can only give a positive reaction (though it need not do so) if the corresponding mother had a positive reaction. If the maternal blood is negative the fetal blood is also negative, whether the child or mother be syphilitic or not. This investigation shows that study of the fetal blood is useless for the diagnosis or exclusion of latent syphilis of the newborn; furthermore, that a positive Wassermann is not an indication for anti-syphilitic treatment.

Moreover, a positive reaction of the fetal serum does not always mean maternal syphilis. The Wassermann reaction depends on altered lipid metabolism which ordinarily exists in pregnancy. The serum of syphilitic pregnant women and luetic infants must differ biologically otherwise the infants with florid lues could not so frequently show a negative reaction. It is possible that positive reactions in fetal serum are most frequently due to damage of the placenta allowing contamination with maternal blood. The fetal lues is in all probability directly due to spirochetes from the maternal circulation.

One practical point in connection with these suggestions is the importance of tying off the child as soon as born before there is the possibility of mixing of fetal and maternal blood which might occur during the separation of the placenta.

LITTLE.

**Widakowich, V.: Concerning Spermatozoa of Syphilitic Individuals.** *Le Semana Medica*, (Buenos Aires), 1920, xxvii, 633.

Few data exist concerning the rôle of the spermatozoa in causation of abortions, premature births, and monstrosities so often observed in syphilitic cases. No one has attempted to correlate a hypothetical deterioration of the germ plasma with morphologic alteration of the sexual cells.

Syphilis has a special tendency, among the infections, to be transmitted to the fetus, causing the latter to become "heredo-infected." In the absence of actual transmission of the infection to the product of conception syphilis has the power of causing alterations in the latter, even though it does not actually harbor the *treponema pallidum*, giving rise to an individual who is "heredodystrophic." The author believes that a relationship can be traced between heredodystrophies and various morphologic anomalies found in the spermatozoa of syphilitic for-bears. The occurrence of isolated stigmata, such as Hutchinsonian teeth, in heredodystrophic offspring of healthy mothers seem to indicate that the maternal sex cell is not a factor in the case, as well as that the direct action of the spirochete is not to be held accountable.



The author has employed spermatodiagnosis in connection with the Wassermann in several groups of cases;

- A.) 41 known syphilitics. All showed abundant pathologic spermatozoa.
- B.) 35 cases of suspected syphilis, of which
  - a. 17 cases showed positive Wassermann and many abnormal spermatozoa.
  - b. 9 cases showed negative Wassermann and few abnormal spermatozoa.
  - c. 9 cases showed negative Wassermann but many abnormal spermatozoa.
- C.) 9 individuals with healthy children, eliminating one who was alcoholic.
- D.) 16 healthy single individuals.

The abnormal forms of spermatozoa noted were those with 2, 3, or 4 heads, each of these types having one to four tails; giant and dwarf forms; anomalies in size and form of the head, e.g. micro-and amerocephalics; and anomalies in the pars intermedia and the tail.

	Normal spermatozoa per 1000 counted	Pathologic
Group C.) 8 individuals with healthy children	average 981.4	18.6
Group D.) 16 individuals, healthy, single	average 981.4	18.6
Group Bb.) 9 individuals, neg. Wass.	average 981.0	19.0
Group average 33 healthy individuals,	average 981.3	18.7
Group A.) 8 syphilitics	average 922.2	77.8
Group A.) 33 syphilitics	average 949.0	51.0
Group Ba.) 17 cases pos. Wassermann	average 945.2	54.8
Group average, 58 syphilitics,	average 944.2	55.8

Of Group Bc. the 9 cases with negative Wassermann and abundant pathologic spermatozoa, the majority either gave very suggestive histories, or were much benefited by empiric treatment with mercury.

Of 5 cases of heredosyphilis the author found 68, 100, and 117 per 1000 of pathologic spermatozoa in three. Two alcoholics showed 12 and 18 per 1000 abnormal spermatozoa, respectively. Gonorrheal complications observed by author caused no increase in pathologic forms.

THOS. R. GOETTEALS.

**Hinton: The Wassermann Reaction in Pregnancy.** The American Journal of Syphilis, 1923, vii, 155.

Hinton made a study of the Wassermann reaction in 10,427 pregnant women collected from four institutions. He thinks the results are representative of the average women of the dispensary class in Massachusetts. While the positive reaction varied from 1.57 per cent in one institution to 5.6 per cent in another, the average was 4.18 per cent. Adding to these the doubtful cases, which he considers to represent insufficiently treated cases, he obtains a total incidence of 8.3 per cent of pregnant women with syphilitic taint.

Hinton's extensive experience has led him to the conclusion that properly standardized cholesterinized antigens yield a negligible number of false positive reactions in pregnant women.

R. E. WOBUS.

**Shipley, P. G., Pearson, J. W., Weech, A. A., and Greene, C. H.: X-ray Pictures of the Bones in the Diagnosis of Syphilis in the Fetus and in Young Infants.** Johns Hopkins Hospital Bulletin, 1921, xxxii, 75.

The authors made a study of 300 white fetuses (listed as normal in the Carnegie Institute of Embryology) ranging in age from the sixth month of intra-

uterine life to nearly term. Of these 25 per cent had marked signs of osteal syphilis and 46 out of the first 100 bodies examined had well marked or suspicious lesions. The most frequently and most severely affected bones are in order of frequency: the lower end of the femur, the distal and proximal ends of the tibia, the distal ends of the radius and ulna, the extremities of the metacarpals, the proximal ends of the phalanges, and the proximal ends of the ulna and radius. Any bone may be involved. "The shadows resulting from syphilitic lesions in early life are due to vagaries in the calcification of the provisional cartilage and to the abnormal arrangement and distribution of the osseous tissue." Endochondreal defect is the most important in the fetal type. Periosteal involvement usually appears after birth. Eleven characteristic x-ray pictures of syphilitic bones in various stages of the disease are shown. The shadows are very well described and explained. Scurvy and rickets must be differentiated from osteal syphilis of the fetal type.

C. O. MALAND.

**Henrotay, J.: Fetal Malformations and Syphilis.** *Gynécologie et Obstétrique*, 1922, v, 287.

The author reports two cases of especially interesting malformations. One was a case with a ventral defect with an equino-talus and spina bifida about six and one-half months' gestation. The mother had two infants at term and one premature. Only one was alive. The mother had a positive Wassermann. In the second case the mother had one child 18 years old by a former husband. In the present case there was marked cephalic deformity. The mother had a positive Wassermann; the father was also a syphilitic and had received treatments. The mother had never presented any manifestations of this disease. The author also removed a hydatiform mole from a woman who had a positive Wassermann. There were also two other deformed infants from mothers both of whom had positive Wassermans. He reports in detail a case seen in consultation. The woman had had six pregnancies. The first two babies were born macerated, the second one possibly with a malformation of the head. The third pregnancy resulted in a living infant. The fourth pregnancy was terminated prematurely. The fifth pregnancy resulted in a healthy infant delivered by forceps. The Wassermann was negative at this time. In the sixth pregnancy she was delivered of a child with an eczema. He delivered a sister-in-law of an infant with a cephalic deformity. He also took care of the wife of the brother of the husbands of the preceding two. In these three families syphilis was undoubtedly present though it presented no manifestations. The three brothers probably had hereditary syphilis. The author emphasizes the importance of syphilis in pregnancy and urges obstetricians to investigate carefully for the presence of this disease.

F. L. ADAIR.

**Favreaux, M.: Syphilis and Procreation.** *Journal de Médecine de Bordeaux*, 1921, xcii, 551.

In permitting procreation or marriage in any given case of syphilis one must consider fully the virulence and duration of the infection. In cases treated early, at least one year of treatment and one year of observation with continued negative blood and spinal fluid reactions is required. If the infection is of longer duration the treatment is continued for two or three years, followed by one year of observation with negative serological reactions. The reaction of the spinal fluid must be ascertained in each case. The so-called latent syphilitic is potentially infectious though untreated cases of 8 or 10 years' duration may bear children apparently healthy. Tertiary syphilis does not seem curable and in the

presence of nervous involvement one can not authorize procreation or marriage. In the absence of organic lesions, pregnancy is allowed after two or three years of treatment and one year of observation, the Wassermann reaction remaining negative.

Heredosyphilitics are dangerous. The second generation is susceptible to the infection of the first and has the appearance of being healthy. Pregnancy or marriage are allowed after two or three years of treatment and one year of negative serological reactions. In the absence of symptoms the author does not advise treatment for the wife of the old or latent syphilitic, unless the Wassermann is positive.

The laws of Colles, Baumès and Profeta need revision. It is not probable that the spermatazoon can carry the treponema. Organisms carried far into the genital tract by the spermatic fluid can and do account for obscure cases of syphilis that show the late accidents without ever having had demonstrable early lesions. A child born with syphilis, having a syphilitic father has also a syphilitic mother. This mother can nurse her baby with impunity since she already has the disease. If the mother contracted her infection in the last weeks of the gestation, the child, unless infected in the birth canal, may be free from the disease. This baby should be fed on a formula for twenty days (the Wassermann is not of value before that time).

Sterility caused by syphilis is exceptional. Pregnancy while it aggravates the local (pelvic) lesions, apparently has little influence on the general reaction. The influence of syphilis on pregnancy is well known. Abortion, miscarriage and premature labor are more common than full term stillbirths. There are three specific lesions that often complicate labor: (1) chancre of the cervix; (2) secondary sclerosis and atrophy of the fibro-muscular structures of the cervix; (3) infiltration extending into the lower uterine segment from cervical lesions. These lesions all interfere with cervical dilatation and predispose to tears. The resulting delay in labor may cause death of the fetus and possible amniotic infection. Internal medical treatment of cervical chancre discovered early prevents stenosis. If early in labor absolute cervical rigidity from the above causes is diagnosed, the membranes being intact, one may resort to cesarean section. Couvelaire objects to abdominal section for delivery in the presence of florid syphilis. Incision of the cervix is often necessary to effect delivery. The child being dead, destructive operations need not be delayed.

Malposition, prolapse and inertia are common causes of dystocia with the syphilitic in labor. Hydrocephalus, ascites and monstrosities frequently alter the head diameters and complicate labor. Although syphilis predisposes to tears, infection and decidual endometritis with retention of placenta and membranes, involution after labor is fairly rapid.

Forty-one per cent of fetal deaths in gestation are due to syphilis. The effect of the disease on the infant is proportional to the age and virulence of the infection. The Wassermann or Hecht reactions are of little value in the newborn before the twentieth day. Placental hypertrophy is rare in syphilitics treated with arsenic. Manouélian has found the vessel walls of the villi and cord to contain many spirochetes. From the pathological study of the placenta, Favreaux concludes that the salts of arsenic are efficacious in the pregnant syphilitic.

There is no idiosyncrasy to arsenic among pregnant women and nursing mothers. Treatment during pregnancy should be vigorous and continued. The author advocates the use of neosalvarsan, starting with 15 centigrams and reaching 75 to 80 centigrams by the eighth injection. Frequently three such series, with mercury in the intervals, can be given before term. In cases with inaccessible veins the author advocates intramuscular injections of neosalvarsan or sulfarsenol.

Mercury is not sufficient in the treatment of infantile syphilis. If sinus or intravenous treatment are not practical intramuscular injection is made. If the treatment by mouth is to be employed, lactate of mercury (1-1000), 6 to 8 drops per day per kilogram weight are given in twenty day series. The treatment of choice in infants consists of mercury rubs ( $\frac{3}{4}$  gm.) daily for 10 or 15 days, followed by the subcutaneous or intramuscular injection of sulfarsenol every 4 or 5 days for 8 doses. Ten days' rest periods are allowed between the courses, controlled by blood and spinal fluid reactions.

W. W. SHUTTER.

**Cruickshank, J. N.: Syphilis as a Cause of Antenatal Death.** British Medical Journal, 1922, No. 3222, p. 593.

From a study based upon the Wassermann reaction of over 3,500 specimens of blood and upon the clinical records of 1,000 pregnant women the author concludes: (1) That between 9 and 10 per cent of women of the "hospital class" in Glasgow show evidence of syphilitic infection. (2) That the results of the Wassermann reaction in the blood of the newborn are of little value in proving the presence of congenital syphilis. (3) That the incidence rate of congenital syphilis has been greatly exaggerated by most recent writers. (4) That syphilis in the mother cannot be shown to be a factor of predominating importance in the etiology of the interruptions of pregnancy in the earlier months. (5) That syphilis is one of the most important causes of stillbirth and of interruption of pregnancy in its later months, leading to premature birth, and, more particularly, to premature birth with death of the fetus.

F. L. ADAIR.

**Moore, J. E.: Studies on the Influence of Pregnancy in Syphilis. The Course of Syphilitic Infection in Pregnant Women.** Bulletin of the Johns Hopkins Hospital, 1923, xxxiv, 385.

In this article the author draws the following summary and conclusions:

(1) A critical study of the clinical and experimental evidence in the literature shows that in all probability neither Colles' law nor the theory of paternal transmission of syphilis directly to the fetus are valid. (2) The clinical data supplied by this study of 178 pregnant women with positive blood Wassermann reactions and 22 non-pregnant mothers of syphilitic children supports this belief. (3) Forty-four of these women, or 22 per cent, had outspoken lesions of early or late syphilis at the time of admission. Of the remainder, syphilis was proved or strongly suggested by the history, physical examination, response to treatment, or subsequent course, or a combination of these factors in 72 per cent. In only 21.5 per cent of the total 200 cases, therefore, were all evidences of syphilis (except a positive blood Wassermann) lacking. (4) This study also demonstrates that the factor of pregnancy may cause striking deviations from the usual course of syphilitic infection. If impregnation and infection approximately coincide, or if infection occurs during the course of pregnancy, the patient may develop the usual early manifestations of syphilis which are, however, much milder than if she is infected independently of pregnancy. Of those pregnant patients in whom the probable date of infection could be compared with the type of lesions present, approximately one-half behaved toward infection in this manner. (5) A slightly larger proportion of women, if infected with syphilis at about the time of impregnation, fail to develop any of the usual early lesions of syphilis. Under these circumstances, it is fair to assume that pregnancy is the factor which suppresses the lesions of the disease. (6) In a few patients (in this series, three of 200 women), the response to infection acquired at the beginning of or during pregnancy is markedly altered. The usual time relations between primary and sec-



ondary syphilis are much prolonged; on the other hand, the interval between early syphilis and tertiarism may be much shortened, and grave lesions of a tertiary type may appear early in the course of the disease. (7) The protection against early lesions of syphilis afforded by pregnancy may persist over a long period of years and possibly for a lifetime. Spontaneous cure of syphilis seems in a few instances to have been the ultimate result. In those women of this series who developed late syphilis, the viscera, and particularly the cardio-vascular apparatus were especially prone to involvement; whereas tertiary lesions of the skin or bones and neuro-syphilis, either clinical or asymptomatic, were rare. (8) It is shown that in 33 of these 200 patients, the blood Wassermann reaction gave anomalous results. In 10 per cent of the pregnant women with secondary syphilis, the reaction was negative. In the women with latent syphilis, it was prone to vacillate markedly without treatment; and in a number of cases, a negative or positive reaction during pregnancy spontaneously changed to the reverse after delivery. The possible factors responsible for this condition are briefly considered. (9) The nature of the mechanism by which pregnancy causes these alterations in the course of syphilitic infection is unknown. Various possibilities are mentioned.

C. O. MALAUD.

**Findley, Leonard: The Antenatal Treatment of Congenital Syphilis with Salvarsan and Mercury.** *British Medical Journal*, 1921, No. 3178, p. 887.

The treatment of congenital syphilis has been unsatisfactory. The author was unable to obtain a cure in 10 per cent of the children under one year and in 50 per cent of those who first came under observation when over one year old. In many of the cases considered cured there was subsequent return of clinical manifestations. The author estimates that 20 to 30 per cent of the pregnancies in syphilitic mothers result disastrously to the fetus. The results of antenatal treatment have been satisfactory. The author reports only 15 cases. In only one of these was the fetus lost. These children have subsequently remained well, some of them having been under observation as long as 7 years. The mothers subsequently gave birth to non-syphilitic children. The author thinks that pregnancy is a particularly opportune time for the treatment of syphilis.

F. L. ADAIR.

**Boas, H., and Gammeltoft, S. A.: The Treatment of Syphilis During Pregnancy with Particular Attention to the Infants.** *Acta Gynecologica Scandinavica*, 1922, I, 309.

Among 158 pregnant syphilitic women not treated at all, only one baby was born without syphilis. Among 87 patients who were treated with mercury before pregnancy but who received no treatment during pregnancy, all the fetuses but nine were luetic. Of 15 women treated with salvarsan before pregnancy and who had no treatment during pregnancy, all but three gave birth to luetic fetuses. Among 111 patients who received mercury during pregnancy, only 31 gave birth to normal children, while of 79 who received salvarsan during pregnancy, 60 had healthy babies. Nineteen of 26 patients who received salvarsan before pregnancy and mercury during pregnancy, gave birth to normal infants; whereas 6 of 7 women who received salvarsan both before and during pregnancy had normal children. From these results it is obvious that every pregnant woman who has syphilis should be treated with salvarsan during pregnancy even though she may have been treated intensively before pregnancy. Contrary to the statements found in many books on syphilis, the spontaneous gradual diminution in the transmission of lues to the fetus after repeated pregnancies, is not a common occurrence, unless the patients are treated during pregnancy.

J. P. GREENHILL.



**Williams, J. Whitridge:** *The Influence of the Treatment of Syphilitic Pregnant Women upon the Incidence of Congenital Syphilis.* Bulletin of the Johns Hopkins Hospital, 1922, xxxiii, 383.

Intensive work in the treatment and observation of a great many syphilitic pregnant women over a number of years, and in recent months a study of a number of their children from four to twenty-eight months after their birth, leads Williams to draw the following conclusions: Almost ideal results follow anything like efficient treatment of syphilitic pregnant women. Surprising results may sometimes follow what would ordinarily be regarded as altogether inefficient treatment in men or in non-pregnant women, which would seem to indicate that pregnant women are unusually amenable to antisyphilitic treatment. Some cases were extraordinarily refractory to treatment. There must be something about the pregnant condition which mitigates the virulence of the disease and predisposes to spontaneous cure.

C. O. MALAND.

**Adams, John:** *The Antenatal Treatment of Congenital Syphilis with Salvarsan and Mercury.* British Medical Journal, 1922, No. 3185, p. 56.

The author urges the earliest possible treatment of all cases of syphilis. This especially applies to newborn babies. He gives some tabulated results of the treatment of women during pregnancy and of newborn children. During a period of four years there were 113 mothers with syphilis treated; 31 babies were born alive with positive Wassermanns; 79 with negative Wassermanns; 4 of these babies died later. There were 8 stillbirths.

F. L. ADAIR.

**Kirstein, F.:** *Salvarsan Rash in Pregnancy. Death in the Puerperium.* Zentralblatt für Gynäkologie, 1922, xvi, 1634.

Kirstein refers to a case reported by Lorenzen (Zent. für Gyn., 1921, 39) of salvarsan rash and resultant infection, and reports a similar case where the administration of salvarsan to a pregnant woman caused a skin rash which was remarkably irritating. In the previously reported case this skin irritation had been considered responsible for organisms introduced during vaginal examination, and the author, therefore, undertook vaginal examination with considerable trepidation. The patient became profoundly infected, and though the autopsy, some 14 days later, showed the presence of a severe infection of the lung, the suspicion remains that the death was possibly associated with the skin rash.

LITTLE.

**Vignes, H., and Galliot:** *The Prophylactic Treatment of Hereditary Syphilis in the Lying-In Hospitals of Paris.* Progrès Médical, 1923, xxxviii, 1.

Pleading for a more thorough diagnosis and more efficient treatment of syphilitic women and newborn babies, this article brings out clearly the various methods utilized in the maternities of Paris. To show that syphilis plays an important part in fetal mortality the authors quote the statistics of the Baudeloeque Clinic for 1920—stating that 50 per cent of stillbirths and 25 per cent of children dying before the tenth day could definitely be ascribed to syphilis.

According to these authors the disease may be suspected by the history of previous miscarriages or stillbirths or by such complications as hydramnios or fetal death, also by fetal death before or during labor without sufficient other cause, or by manifestations of a luetic infection in the placenta. Finally the disease may be recognized by a careful examination of the newborn.

Syphilis once having been recognized, the mother, or if labor has taken place and the child survived, mother and child are immediately subjected to strenuous anti-syphilitic treatment. In the maternities of Paris this treatment has been assured by the inauguration of treatment stations in the hospitals themselves. The authors feel that in this way many cases are treated who, if merely advised to go to a general hospital for treatment, would be missed.

As a proof of the efficiency of early anti-syphilitic treatment the following statistics are quoted:

21 Women treated before and during pregnancy	
children living	21
children dead	0
29 women treated during pregnancy	
children living	27
children dead	2
16 women receiving only partial treatment during pregnancy	
children living	9
children dead	7
53 women not treated	
children living	20
children dead	33

THEODORE W. ADAMS.

**Bernard, L:** *The Relation of Pulmonary Tuberculosis and Pregnancy.* Paris Médical, 1922, xii, 22.

Of 164 tuberculous women seen in 1921, he found that the phthisis had its origin either during pregnancy or the puerperium in over 18 per cent. Of 327 female patients observed at a tuberculosis clinic in Paris, 81 (24 per cent) had recently been pregnant. This convinces him that there is no question that tuberculosis very frequently either has its origin or becomes aggravated during pregnancy or after confinement.

Of the 81 clinic patients, 55 had not had previous symptoms; of these, 22 developed their first symptoms during confinement, and 33 after delivery. Twenty-six had had previous manifestations; of these 15 had an aggravation of symptoms during the puerperium, and 11 after confinement. Like Bar, Bernard found tuberculosis much more frequent in primiparae than in multiparae. In fact, he encountered only one case where the disease did not manifest itself until the fourth, and one until the sixth gestation.

He believes that lactation is a most deleterious factor. Of 27 women in whom the tuberculosis manifested itself after confinement, 18 had nursed their infants, while 3 had not nursed them. In 6 cases no accurate information was obtainable.

Nobecourt and Paraf had demonstrated a definite lowering of resistance to tuberculosis during pregnancy by the fact that in a tuberculous woman with positive cutaneous reaction, this reaction becomes negative during pregnancy. This would indicate that the immunity against the bacillus of Koch is definitely lowered during gestation. Bernard however, did not find this to be so in all his cases.

In spite of these figures, Bernard feels that therapeutic abortion is necessary only rarely, provided that the patient receives proper treatment. Especially in fibrous phthisis, the patient usually can be carried through pregnancy without very great risk if she is properly handled. Latent tuberculosis usually becomes aggravated only in the latter months of gestation when one naturally hesitates

doing an abortion in the hope of obtaining a viable child. The production of abortion will not always check the disease, the pregnancy usually being only an accessory factor and not the whole cause of the danger, as, e.g., in hyperemesis, in which the induction of abortion almost certainly cures the patient. The induction of abortion in itself is not without danger; it may, not frequently, be more disastrous than labor itself. Greater progress in this field will be made by earlier diagnosis and treatment. He has seen favorable results even in caseating tuberculosis by the administration of proper therapeutic measures, including pneumothorax. He has seen tuberculous women, under proper management, pass through successive pregnancies, the resulting children being perfectly healthy.

Bernard is very emphatic, however, about the deleterious effect of nursing, both to mother and child. Only under certain conditions, as when the child fails to thrive on artificial food, should it be permitted to nurse temporarily, and then only under the strictest aseptic precautions.

While Bernard has no fault to find with those who differ with him, especially the obstetricians, yet he feels that the latter, in contradistinction to the internists, have taken an altogether too pessimistic attitude towards this question.

R. E. WOBUS.

**Petruschky, J.: Further Observations on Pregnancy and the Offspring of Specifically Treated Tuberculous Women.** *Monatschrift für Geburtshilfe und Gynäkologie*, 1922, lix, 245.

In a previous communication (1911) the author has shown that 50 per cent of the women with open tuberculosis and 100 per cent of those with closed tuberculosis, who were treated properly, went through pregnancy without harm. In the former group 58 per cent and in the latter 100 per cent of the children remained alive. These figures prove that therapeutic abortion for tuberculosis is seldom indicated especially in cases of closed tuberculosis. The author also claims that the children of tuberculous parents instead of being predisposed to this disease, resist it better than other children.

Operations on tuberculous women should be reduced to a minimum because of the danger of metastases to the operative region.

Forty patients have been treated since 1911 with as much success as formerly. In all the patients the tuberculous process was improved. All the children were born free of tuberculosis and remained alive. Of late the author has combined pneumothorax with specific treatment. The latter is simple and should be tried before therapeutic abortion is contemplated; for when an abortion is performed, the child is always condemned and the mother is often made worse. Under specific treatment, not only are the children saved but the mothers are actually improved in health.

J. P. GREENHILL.

**Dumarest, F., and Brette, P.: Pregnancy and Tuberculosis.** *La Presse Médicale*, 1922, xxx, 531.

Prior to the middle of the nineteenth century, pregnancy was held to exert a beneficial influence upon tuberculosis. About 1850, cases of tuberculosis aggravated by pregnancy were reported by Mauriceau and by Grisolle, and little by little the idea of artificial termination of the supposedly malevolent pregnancy gained ground. Of late, this pessimistic attitude seems to be the prevailing one, even in France, where therapeutic abortion for tuberculosis has heretofore had practically no advocates. The authors have seen cases of this disease aggravated by pregnancy and by the puerperium, and have also been deeply impressed by several cases

in which pregnancy has apparently exercised beneficial effect upon the tubercular process. Details of nine such cases are given, the disease being of the chronic fibrous type except in one instance; in this patient a rapidly progressive ulcerative phthisis improved markedly during pregnancy, but it became more active after delivery, and the patient succumbed two years later.

The authors also report eight cases of pregnancy in women upon whom artificial pneumothorax had been performed, at intervals varying from nine years to a week or so before the inception of the pregnancy; in two cases pregnancy and pneumothorax were concomitant. One of these eight patients died the year following delivery; one could not be traced; one developed a lesion of the other lung two months after delivery (this was one of the concomitant cases); the others improved and the tubercular processes were arrested. In three instances treatment by pneumothorax was continued after delivery.

Induction of abortion or of premature labor is strongly condemned, except in the very rare case in which the mother's condition is extremely grave and the child is viable. Here labor may be induced in the interest of the child. The child's interests are held to be paramount in all cases for the following reasons: (1) if the mother has a slowly progressing fibrous phthisis, pregnancy will be beneficial; (2) if the mother's disease is very active, and is aggravated by the pregnancy, her chances of recovery are very poor anyway, and will hardly be improved by interruption of the gestation; in such a case artificial pneumothorax will often be marvellously beneficial. (3) Furthermore, supposedly hereditary tuberculosis is no longer feared. It appears probable that the human race (especially the white branch) is gradually acquiring an immunity to tuberculosis. In this development the children of parents with arrested tuberculosis play an important part, in that it seems possible that they inherit the immunity possessed by their parents at the time of procreation, and pass it on in turn to their descendants; thus will the bacillus of Koch ultimately be vanquished.

E. L. KING.

**Winter and Oppermann: Tuberculosis and Pregnancy.** Deutsche Medizinische Wochenschrift, 1923, xlix, 1, 45 and 76.

The question of tuberculosis in pregnancy has aroused renewed interest in Germany on account of the marked increase of tuberculosis during and following the war. In Winter's clinic the number of pregnant women with tuberculosis has gradually increased from 11 cases in 1917 to 33 cases in 1922. During the same time the number of deaths from tuberculosis in general has almost doubled, the relative increase being more marked in women of the child bearing age.

That pregnancy has a deleterious influence on the tuberculous woman is beyond dispute. According to 18 observers, the mortality after pregnancy varies from 16 to 100 per cent. Aggravation of an existing tuberculosis by pregnancy has been estimated variously by 14 observers at from 64 to 100 per cent. Of 138 pregnant women suffering from pulmonary phthisis who were observed by Winter, 93, i. e., 67 per cent showed unmistakable aggravation of their tuberculosis. In patients with latent or healed tuberculous processes, activation was observed in only one-fifth of the cases, while in active tuberculosis only 14 per cent of the patients remained uninfluenced by the pregnancy. In laryngeal tuberculosis, Winter believes, pregnancy means the death of the patient.

Various observers have estimated that of children born of tuberculous mothers only from 20 to 40 per cent reach the age of 20 years. Therefore, these authors feel that one is not justified in subjecting the mother to an undue risk in the hope of conserving the child.

Since pregnancy has no specific influence on the tuberculous process, the authors again warn against too optimistic a prognosis in case of therapeutic abortion, since the most one can hope for under these conditions is a cessation of such baneful influence which a continuation of pregnancy might have. The abortion in itself can have no therapeutic action. In latent or healed phthisis, abortion is contraindicated except in unusual cases. In active tuberculosis abortion is recommended at any stage of pregnancy up to the seventh month, premature delivery being indicated only in primary cases. In most instances, in which Winter refused to perform abortion in case of active tuberculosis, he had reason to regret it afterwards.

While in a given case it may be advisable to produce a second or even third abortion, the authors warn against repeated abortions as a suitable method of handling these cases. Sterilization may be obtained by operative procedures or, preferably, by x-rays. In cases where the woman is still young and a permanent cure may be looked for, temporary sterilization may be the method of choice. In numerous cases Winter has combined vaginal hysterectomy with interruption of pregnancy, thus not only sterilizing the woman, but saving her the periodical loss of blood incident to menstruation.

R. E. WOBUS.

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## Books Received

LEHRBUCH DER STRAHLEN-TIEFEN-THERAPIE und ihrer Anwendung in der Gynäkologie. Von Prof. Dr. Ernst von Seuffert, Med. Rat der Hebammen Schule in München. Mit einem Geleitwort von Geh. Rat Prof. Dr. A. Döderlein. Mit 77 Abbildungen im Text und 21 Tafeln. Verlag von S. Karger, Karlstrasse, Berlin, 1923.

EINFUEHRUNG IN DIE KLINIK DER INNEREN SEKRETION. Von Professor Dr. G. Peritz, Nervenarzt in Berlin. Mit 31 Abbildungen. Verlag von S. Karger, Berlin, 1923.

DER GEBURTSHILFLICHE PHANTOMKURS. Von Professor Dr. Wilhelm Liepmann, Friedrich Wilhelm Universität in Berlin. Mit 165 Federzeichnungen. Verlag von Urban und Schwarzenberg, Berlin & Wien, 1922.

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## Item

The American Child Health Association announces that \$10,000 has been set aside for Resident and Travel Scholarships to be awarded to physicians who want to improve their qualifications for child health work. Application blanks and further information will be furnished on request to the Association, 370 Seventh Ave., New York City.

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## Erratum

In the abstract of Dr. George H. Ryder's article in the August issue of the Journal, on page 212, lines nine and ten should read: The total number of viable fetuses was 52; the number of viable fetuses lost 2, or 3.8 per cent.